

Cooperative
Ecosystem
Studies Units
Network



Annual Report
2002

October 2002

Dear Colleagues,

The CESU Network was born out of the conviction that meeting the challenges of managing federal lands and waters requires the skills and capacities of the nation's universities, and the talents of scientists and scholars throughout the nation. The CESU Network is now 3 years old, and growing vigorously. There are currently 12 CESUs, and the Network includes 13 federal agencies, 89 universities and 24 other partners.

Most importantly, CESUs are (like most 3-year olds) active and engaging. A wide range of research, technical assistance, and education projects are underway. Projects range from restoring ponderosa pine ecosystems to understanding the habitat requirements of the American alligator; from studying the distribution of West Nile encephalitis to documenting historic structures on western federal lands. Faculty, graduate students and other scientists, working with natural and cultural resource managers in federal agencies, are collaborating in new and innovative ways. This report documents the growth and development of the CESU Network. It includes the First Inventory of CESU projects and activities—over 500 completed or on-going projects. It also describes the major accomplishments of the CESU Council.

The CESU Network continues to grow and develop. As this report goes to press, the US Fish and Wildlife Service has joined the South Florida-Caribbean CESU, and the Natural Resources Conservation Service has joined the Great Basin CESU. Additional universities and other institutions are becoming partners to CESUs. Several new CESUs are soon to be established.

Much has been accomplished, and the progress-to-date demonstrates the practical value of CESUs, as well as their extraordinary potential. Challenges and opportunities await. Building the CESU Network is a truly collaborative effort, and all CESU partners can be proud of what is reported in these pages. Thanks to all for your important contributions.

Sincerely,

A handwritten signature in black ink, reading "Gary Machlis". The signature is fluid and cursive, with the first name "Gary" and last name "Machlis" clearly legible.

Gary E. Machlis
CESU National Coordinator

Cooperative Ecosystem Studies Units Network Annual Report

Introduction

Management and stewardship of the nation's public lands and waters requires skillful public service supported by sound science and responsive technical assistance. Complex issues that transcend boundaries make it essential for agencies to work together. In addition, the nation's universities have an important role in providing information for science-based decision-making. Hence, as part of the National Parks Omnibus Management Act of 1998, Congress authorized and directed the Secretary of the Interior to

...enter into cooperative agreements with colleges and universities, including but not limited to land grant schools, in partnership with other Federal and State agencies, to establish cooperative study units to conduct multi-disciplinary research and develop integrated information products (16 USC 5933).

This annual report describes: 1) the concept used in building these important partnerships, 2) the current progress of individual units and the national network, and 3) future activities related to these cooperative study units.

The Cooperative Ecosystem Studies Unit Concept

A network of cooperative study units is being established to provide research, technical assistance, and education to federal agency managers and resource professionals. These units are named Cooperative Ecosystem Studies Units (CESUs) to signify their broad role as providers of research, technical assistance, and education to federal land management, environmental and research agencies, and their potential

partners. *Cooperative* emphasizes that multiple federal agencies and universities are among the partners in this program. *Ecosystem studies* involve the biological, physical, social, and cultural sciences needed to address complex resource issues. Resources encompass natural and cultural resources.

Each CESU is structured as a working collaboration among federal agencies, universities and other partners. CESUs are based at universities and focused on a biogeographic region of the country. Universities provide space, basic administrative support (secretarial, accounting, equipment), and access to university faculty, students, staff, and resources.

Federal agencies contribute research scientists and/or other professionals located and working at CESUs under formal five-year agreements between their respective bureaus and the universities. Federal personnel are supervised and supported by their respective agencies, through existing administrative systems. Participating agencies provide scientific staff, administrative support funds, and project funds for specific research projects and technical assistance. Federal agency participation in a CESU does not alter previous arrangements or cooperative agreements.

Each CESU is comprised of the following key elements:

1. Multiple federal agencies

Federal agencies participate in CESUs within the scope of their respective missions. Federal agencies are substantially involved in CESU activities, working closely with host universities and partner institutions. With multiple federal agencies working together with university faculty, the potential for cost sharing, improved efficiency, and cooperative activities is significantly increased. Collaborative projects among agencies are encouraged and facilitated through the CESU agreements.

2. Host university

A key element of each CESU is the host university. The host university provides space and basic administrative support as part of its responsibilities within the CESU agreement. At least one federal

research scientist and/or other professional is located at the host university. Federal agencies add additional personnel where appropriate to their mission, needs, and available resources.

The CESU staff is augmented by host university faculty, graduate students, and postdoctoral fellows. The host university provides to the federal agencies its expertise for research, technical assistance, and education. For example, a host university can offer educational opportunities for federal resource/environmental managers to improve or renew their skills through continuing education, short courses, workshops, degree programs, distance learning, and other activities.

3. Partner institutions

Additional universities, along with state agencies, tribes and other organizations with special expertise or facilities, participate in CESUs as partners to the host university described above. Partner universities and other institutions significantly expand the capability and skills of a CESU.

Partner institutions are linked to the CESU through agreements that address overhead, cost-sharing, and other initial elements of cooperative ventures. This allows projects with partner institutions to be efficiently conducted. Partnership arrangements make the faculty, graduate students, and facilities of more universities available to participating federal agencies and reduce administrative costs.

4. Role and mission statement

Each CESU prepares a role and mission statement that identifies research, technical assistance, education, and other services that it is especially qualified to provide the region and the nation. The role and mission statement includes the biogeographic area of concentration (such as the Colorado Plateau or the Southern Appalachian Mountains), a focus on particular ecosystem types (such as high deserts or urban areas), an emphasis on particular management regimes (such as wilderness and/or multiple use), or a combination of these themes.

5. Managers committee

The attention of a CESU toward particular research projects or technical assistance and education activities is driven by its role and

mission statement and the participating federal agencies' needs for scientific information, technical assistance, and education. CESUs include a mechanism for managers of the participating agencies to provide advice and guidance on science priorities and CESU activities, while maintaining the independence and objectivity of research projects needed for sound science. Each CESU has a managers committee composed of field managers and additional representatives from participating federal agencies. The committees provide advice and guidance to the CESU, review strategic and annual work plans, and assist in evaluating CESU performance.

6. Strategic and annual work plans

Science planning leads to improved research, more usable knowledge for resource and environmental managers, and reduced costs. Working together, CESU partners at individual CESUs develop multi-year strategic plans, so that participating agencies can effectively allocate resources to meet both immediate and long-term needs.

In addition, each CESU prepares a brief annual work plan for its research and service activities. The plan describes the CESU's ongoing research, anticipated projects, and products. The plans are used to ensure the timely delivery of useful research to managers, coordinate research activities, meet requirements of the Government Performance and Results Act (GPRA), and evaluate CESU performance.

While these key elements are central to each CESU, there is significant flexibility as to how they are to be implemented at each unit. CESUs can build upon existing organizations and arrangements, adapt key elements to local and regional conditions and needs, and innovate in the delivery of science.

The CESU Network

The individual CESUs are organized into a CESU Network. The objectives of the CESU Network are to:

- provide agency managers and resource professionals with a broad range of high-quality scientific research, technical assistance, and education,

- deliver research, technical assistance, and education that is timely, relevant, and necessary to develop and implement sound adaptive management approaches,
- ensure the independence, objectivity, and credibility of research,
- create and maintain effective partnerships to share resources and expertise,
- take full advantage of university resources while fully benefiting the universities, their faculty, and students,
- encourage professional development opportunities for all participants in the CESU Network,
- enhance collaboration among federal agencies to address shared and complex issues through efficient use of federal science resources,
- diversify federal partners' science-related professional and technical workforce,
- collectively identify and address emerging science issues, ideas, and strategies at appropriate scales,
- promote interdisciplinary research, technical assistance, and education, and
- facilitate sharing of capabilities and resources across the CESU Network.

The CESU Network is coordinated by a CESU Council that includes representatives of the federal agency partners, and meets on a regular basis. A CESU National Coordinator is appointed by the Council. The Council issues this annual report documenting the activities and progress of the CESU Network.

CESU Network Current Status

The CESU Network has made significant progress since its inception in June 1999. Four CESUs were competitively established during 1999 — the Colorado Plateau, Rocky Mountains, Southern Appalachian Mountains, and North Atlantic Coast. In 2000, a second competition added four more CESUs — the Pacific Northwest (including Southeast Alaska), Desert Southwest, Great Plains, and South Florida-Caribbean. In

2001, two CESUs became operational — the Chesapeake Watershed and Great Basin. Following a fourth round of competition, two additional CESUs for the Great Lakes-Northern Forest and Gulf Coast were established in 2002. A fifth competition was completed in June 2002, covering additional CESUs in five biogeographic areas — Californian, Hawaii-Pacific Islands, North and West Alaska, Piedmont-South Atlantic Coast, and Upper and Middle Mississippi Valley (see map insert). When these CESUs are established in 2003, the CESU Network will be complete.

In 2001, the National Aeronautics and Space Administration joined the CESU Network. The Natural Resources Conservation Service, the Agricultural Research Service, and the National Marine Fisheries Service joined the Network in 2002. Thirteen federal agencies currently participate in the CESU Network:

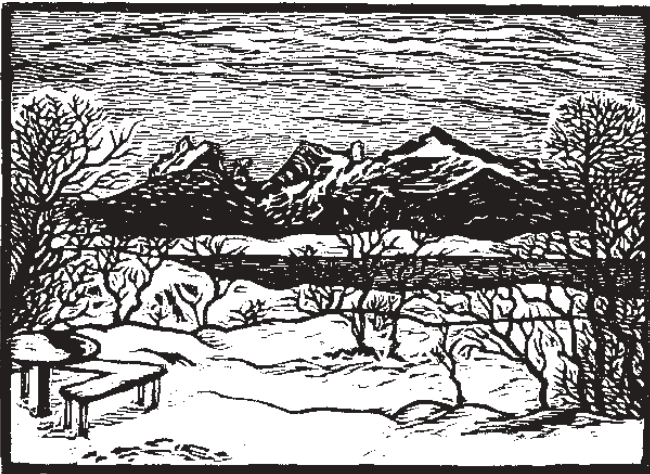
- Bureau of Land Management (BLM)
- Bureau of Reclamation (USBR)
- US Fish and Wildlife Service (USFWS)
- US Geological Survey (USGS)
- National Park Service (NPS)
- Agricultural Research Service (ARS)
- USDA Forest Service (USDA-FS)
- Natural Resources Conservation Service (NRCS)
- Department of Defense (DOD)
- Department of Energy (DOE)
- Environmental Protection Agency (EPA)
- National Aeronautics and Space Administration (NASA), and
- National Marine Fisheries Service (NMFS)

The CESU Network currently includes 89 universities (including 17 minority institutions), and 24 state, tribal and non-governmental partners; 43 states and territories are represented. The map insert shows the CESU Network, including the existing and planned CESUs. Appendix 1 provides a list of host universities and partners.

Activities of the CESU Network

1. *Several additional CESUs were competitively established.*

CESUs are implemented through a formal competition process that includes a detailed Request for Proposals (available on the CESU website), formal proposals submitted by potential host universities and their partner institutions, and a careful review and selection process involving multi-agency review panels and site visit teams. In 2001, the third round of CESU competition led to two additional CESUs being operational — the Chesapeake Watershed and Great Basin. The fourth round of competition was held in 2001-02, and two additional CESUs — the Great Lakes-Northern Forest and Gulf Coast — were established in 2002.



2. The Second National CESU Network Meeting was held in June 2001.

The Second National CESU Network Meeting was held 19-20 June 2001, at the headquarters of the American Association for the Advancement of Science (AAAS) in Washington, DC. Over 120 representatives from federal agencies, host universities, partner institutions, and other organizations attended the 2-day event. Sessions focused on progress in developing the CESU concept, case studies of successful projects and CESU activities, strategic planning, cooperative agreement administration, and other issues of interest. During the Network Meeting, the National Aeronautics and Space Administration (NASA) signed the CESU Memorandum of Understanding and became the tenth federal agency to join the CESU Network.



The Second National Network Meeting included presentations by university and federal agency participants...



...and opportunities for discussion and feedback.

3. The First Inventory of CESU projects and activities was compiled.

In October 2001, the First Inventory of CESU projects and activities was initiated. Mr. Bruce Campbell joined the CESU Network Staff as a

Research Associate, and developed an inventory protocol and database. Each CESU was contacted and generously provided information on projects and activities. In calendar years (CYs) 99-01, over 500 projects were implemented through CESU agreements. The results of the First Inventory are presented in this annual report (see pgs. 12 to 61).

4. A draft Strategic Plan for the CESU Network was prepared.

As discussed earlier in this report, each CESU is developing a strategic plan to guide its development. In addition, the CESU Council is responsible for preparing a CESU Network strategic plan. The CESU Council has prepared a draft plan, which is currently being revised. When it is complete, the draft plan will be sent to all CESU partners for review and comment. This CESU Network strategic plan describes the goals and strategies for the National Network. The plan includes:

- formal description of the CESU Council and staff responsibilities,
- designation of CESU biogeographic regions to achieve full national coverage,
- goals and strategies for achieving the objectives of the CESU Network,
- recommendations for Network-level projects and funding to assist CESUs, including special initiatives in technology infrastructure, professional development, and multi-agency collaborations, and
- a timeline for completing the CESU Network and achieving the objectives of the Strategic Plan.

5. An Administrative Guide for the CESU Network was drafted.

Each agency that participates in the CESU Network has its own policies, regulations, and procedures for administering cooperative/joint venture agreements. All agencies follow relevant federal law (such as the Federal Grant and Cooperative Agreement Act) and policy (relevant OMB circulars). A CESU Administrative Guide is being prepared, which will cover procedures unique to the CESU Network (such as adding or deleting partners to a CESU), as well as serving as a useful source for CESU policies established by the Council, and other operational information. Dr. Jim Stone from the Bureau of Land Management spent

an intensive 3-month detail with the CESU Staff drafting the administrative guide. This first draft is currently being revised, and will be distributed to all CESU partners for review and comment.

6. The CESU Network Website, <http://www.cesu.org/cesu>, was updated.

The CESU Network website is an important source of information about CESUs and any CESU partners.

The website provides access to a wide range of information about CESUs, including a general introduction to the concept; maps of current and planned CESUs; agreements and strategic plans for current CESUs; schedules for meetings and other activities of the Council; a directory; an administrative guide, and materials for current competitions.

In 2001-02, the website was updated and links to individual CESU websites were included.

7. Additional federal agencies and universities became members of the CESU Network.

As the CESU Network develops, additional federal agencies find it advantageous to participate. In 2000, the Department of Defense (Installations and Environment), Environmental Protection Agency, and US Fish and Wildlife Service joined the Network. In 2001, the National Aeronautics and Space Administration joined. In 2002, the Natural Resources Conservation Service, Agricultural Research Service, and the National Marine Fisheries Service became the newest federal agencies to participate in the CESU Network.

In addition, 9 universities have joined existing CESUs since they were established. The ability of the CESU Network to adapt and engage new partners is an essential part of the CESU concept.

8. CESU Council Meetings were held, and CESU Network Staff provided technical assistance to agencies and universities.

The CESU Council meets regularly throughout the year in Washington, DC. In 2001, four Council meetings were held. Minutes of these meetings are available on the CESU website.

CESU Council Staff provided technical assistance to federal agencies and universities as requested. Presentations about the CESU concept were made at several scientific conferences and agency meetings.

Future Activities of the CESU Network

In 2003, several key activities of the CESU Network are scheduled for completion:

- full national coverage of the CESU Network — all states and U.S. territories will be included in CESU biogeographic regions,
- the CESU Strategic Plan will be completed and approved by the CESU Council,
- the CESU Administrative Guide will be completed and approved by the CESU Council,
- the Biennial CESU Network Meeting will be held June 2003 in Washington, DC,
- additional federal agencies, universities and other partners, will be added to the CESU Network, and
- a training and development program for CESU coordinators will be initiated to assist them in furthering the CESU concept.

First Inventory of CESU Projects and Activities

Throughout the CESU Network, a wide range of research, technical assistance, and education projects are underway. To document the breadth of CESU activities, a First Inventory of CESU projects and activities was conducted.

The objective of the First Inventory was to construct a database containing information on all CESU Network projects and activities underway or completed prior to the close of CY 2001. The First Inventory collected information about each CESU project, including:

- project title,
- project location,
- total project cost,

- project funding source(s),
- project initiation and completion dates,
- project type (e.g. research, technical assistance, or education),
- project discipline (e.g. biological, physical, social, cultural, or interdisciplinary),
- project principal and co-principal investigators, and
- participating federal agencies, institutions, and non-governmental organizations.

The First Inventory also collected information on the status of each CESU, such as:

- updated contact information for participating federal and non-federal partners,
- amendments to the CESU agreement adding new partners, and
- the status of the strategic plan, role and mission statement, Managers Committee, annual workplan, and website (if available).

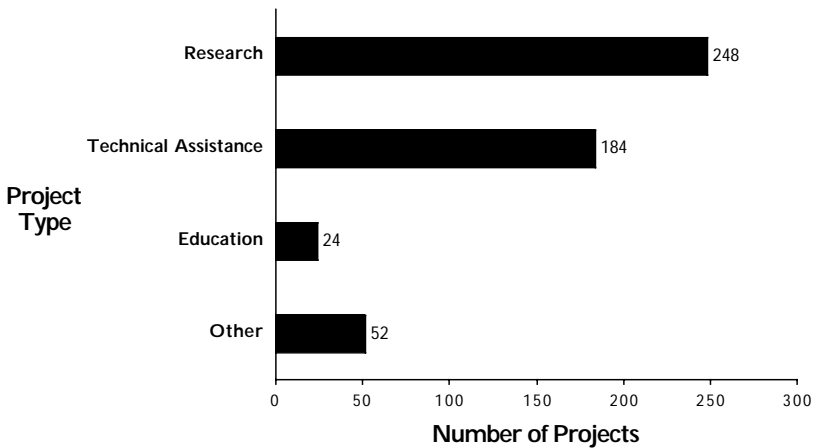
Results reported from the First Inventory include projects by type, discipline, cost, and funded dollars by agency. Results are presented for the CESU Network first, and then for each individual CESU. The host and partners for each CESU are also listed. (Because the Great Lakes-Northern Forest and Gulf Coast CESUs were established mid-2002, they are not included in this First Inventory. A list of their hosts and partners can be found in Appendix I.)

CESU National Network

At the close of CY 2001, the CESU Network was responsible for 508 projects totaling \$27,038,000 in support funds (see Figures 1-4). 49% of the projects were research-oriented, 36% involved technical assistance, 5% focused on education, and 10% were general or "other." By scientific discipline, 41% of the projects involved the biological sciences, 16% involved the physical sciences, 9% involved the social sciences, 10% involved the cultural sciences, and 24% were general or interdisciplinary. Small projects of less than \$25,000 in support funds were most common

(55%). Several large projects (more than \$1,000,000) were underway. The National Park Service provided 72% of the total project funds, the Bureau of Land Management provided 23%; other federal agencies collectively provided 5% of project costs.

**Figure 1. Number of Projects by Project Type,
CESU National Network, CYs 99-01
(N=508 Projects)**



**Figure 2. Number of Projects by Project Discipline,
CESU National Network, CYs 99-01
(N=508 Projects)**

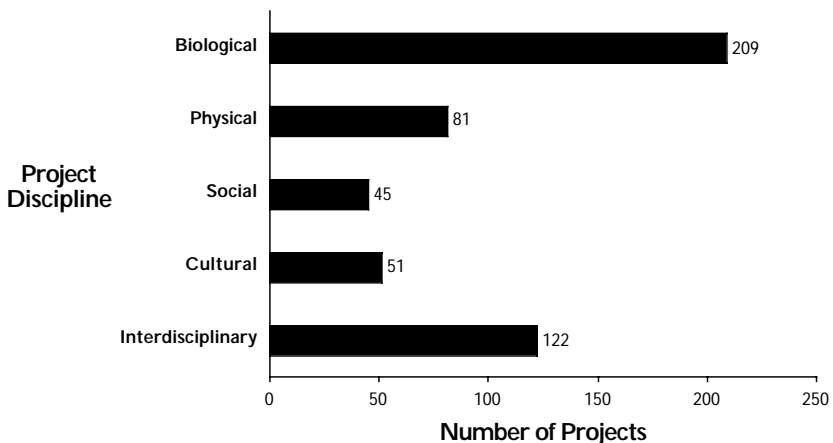


Figure 3. Number of Projects by Project Cost, CESU National Network, CYs 99-01 (N=508 Projects; \$27.04 million)

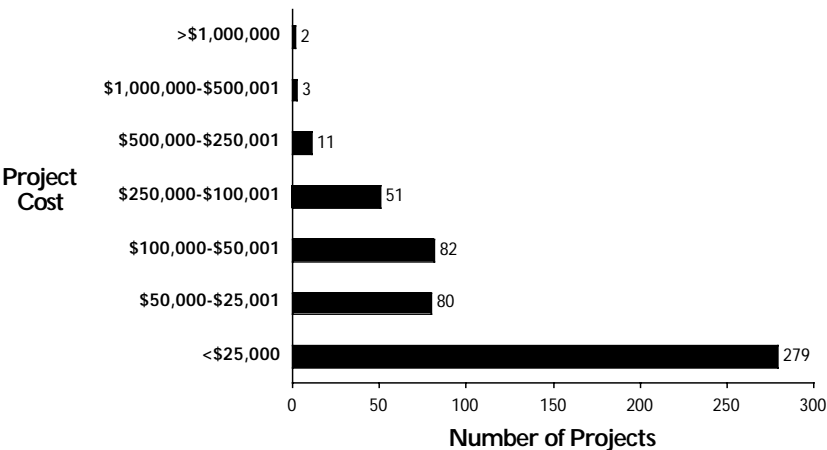
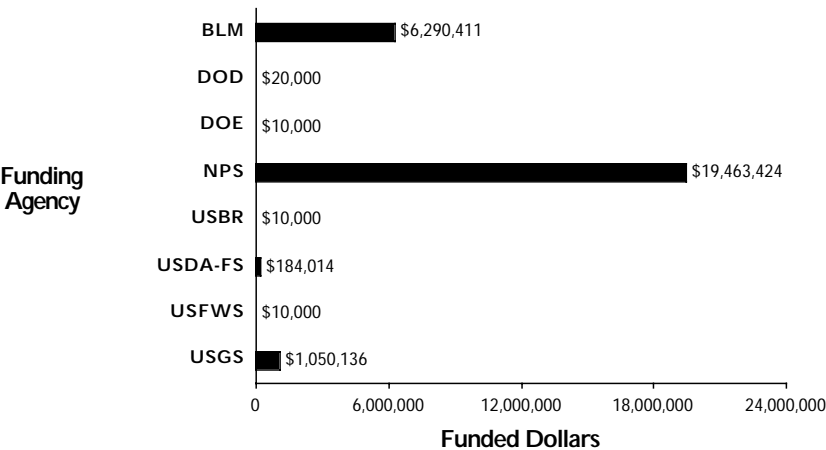
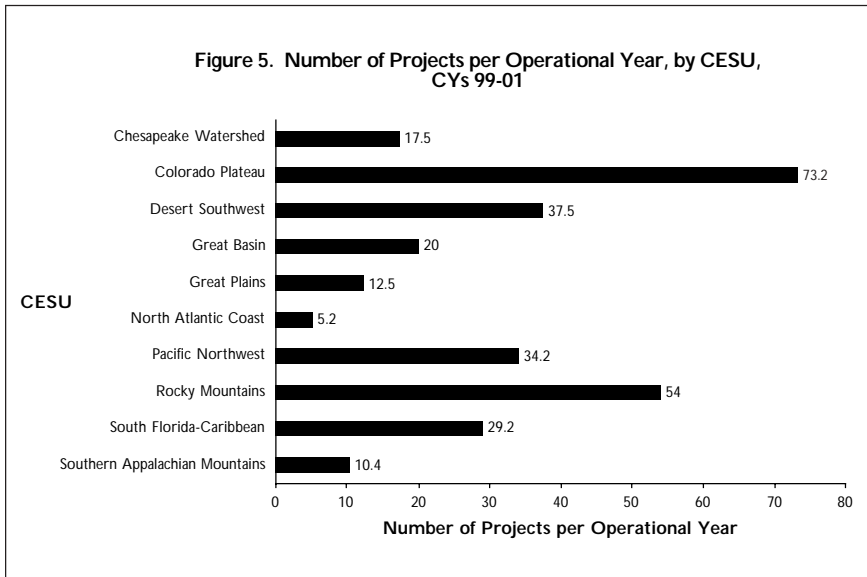


Figure 4. Funded Dollars by Funding Agency, CESU National Network, CYs 99-01 (N=508 Projects; \$27.04 million)



Because all CESUs have not been part of the CESU Network for equal periods of time, reporting the number of projects based on a common unit of operational time is useful. An Operational Year (OY) is defined as a 12-month period of time over which the CESU has been operational. The number of projects per operating year is calculated by dividing the total number of projects by the number of years (rounded to the nearest month of operation) the CESU has been operational and serves as a measure of CESU activity (see Figure 5).



CESUs managing 50-100 projects per OY included the Colorado Plateau and Rocky Mountains. These two CESUs became operational in June 1999. CESUs that managed 25-50 projects per OY included the Desert Southwest, Pacific Northwest, and South Florida-Caribbean. These CESUs became operational in October 2000. CESUs that managed less than 25 projects per OY included the Southern Appalachian Mountains and North Atlantic Coast (both operational beginning June 1999), the Great Plains (which began operations in October 2000), and the Great Basin and Chesapeake Watershed (both became operational August 2001).

First Inventory Results for Individual CESUs

Colorado Plateau CESU



The Colorado Plateau CESU is hosted by Northern Arizona University. The CESU became a member of the CESU Network in June 1999. The CESU host and partners represent Arizona, Colorado, Kansas, Nevada, Oregon, and Utah. They include 5 federal agencies, 9 universities, and 3 non-governmental organizations.

Federal Partners:

Bureau of Land Management
US Bureau of Reclamation
US Geological Survey
National Park Service
USDA Forest Service

Partner Institutions:

Arizona State University
Colorado State University
Diné College
Haskell Indian Nations University
Oregon State University
University of Arizona
University of Nevada - Reno
Utah State University
Museum of Northern Arizona
Navajo Nation Archeology Department
The Arboretum at Flagstaff

The Colorado Plateau CESU mission statement is:

The Colorado Plateau CESU is a cooperative network, transcending political and institutional boundaries, which creates innovative opportunities for research, education, and technical assistance in support of the management and stewardship by partner agencies of the Colorado Plateau's natural, cultural, and societal resources.

Several research themes have been identified to address the unique environments and situations within the Colorado Plateau, including, but not limited to:

- gap analysis,
- adaptive resource management,
- ecosystem-based restoration,
- conflict resolution,
- terrestrial and aquatic invasive and exotic species,
- inventory and monitoring of threatened and endangered species, and air and water quality,
- the urban interface, especially with respect to fire, and
- sage grouse biology, ecology, and management.

Summary of Projects and Activities

The role and mission statement and annual workplan have been completed, and are posted on the CESU's website, <http://www.cpcesu.nau.edu>. The Managers Committee for the CESU has been established. The strategic plan for the Colorado Plateau CESU is under development, and should be completed in September 2002.

At the close of CY 2001, the Colorado Plateau CESU was responsible for 183 projects totaling \$13,850,000 in support funds (see Figures 6-9). 45% of the projects were research-oriented, 45% involved technical assistance, 4% focused on education, and 6% were general or "other." By scientific discipline, 37% of the projects involved the biological sciences, 18% involved the physical sciences, 12% involved the social sciences, 10% involved the cultural sciences, and 23% were general or interdisciplinary. Small projects of less than \$25,000 in support funds were common (39%), while 61% of the projects in CYs 1999-01 were more than \$25,000. The National Park Service provided 77% of the total project funds, the Bureau of Land Management provided 18%; other agencies collectively provided 5% of project costs.

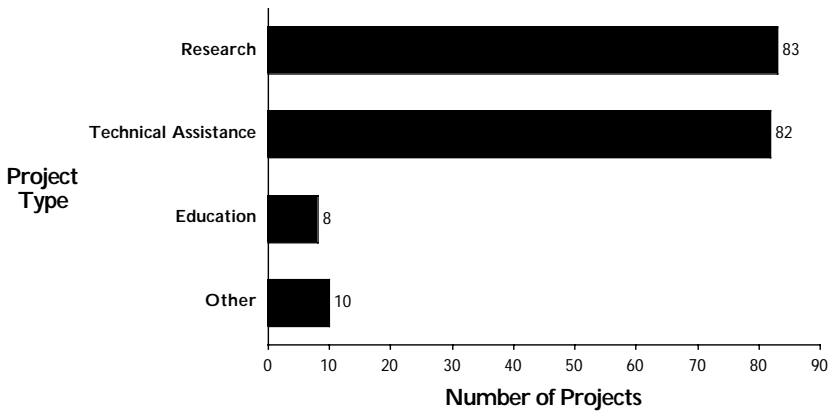
Selected projects underway within the Colorado Plateau CESU focused on:

- restoring ponderosa pine ecosystems (BLM),
- conducting surveys of Colorado River neotropical migrant land-bird species (USGS),
- inventory and monitoring natural resource status and trends in the National Park System (NPS),
- understanding the effects of fire on regional air quality and visibility (NPS),
- understanding minority visitor use patterns and examining barriers and constraints in Rocky Mountain National Park (NPS),
- assessing visitor experience and resource protection in Flagstaff area national parks (NPS),
- conducting rock image documentation, condition assessment and investigation in Canyon de Chelly National Monument (NPS),
- establishing baseline water quality conditions in the National Park System (NPS), and
- developing a “science in our parks” education program (NPS).

More information about the Colorado Plateau CESU is available at <http://www.cpcesu.nau.edu> and/or by contacting Dr. Roderic Parnell at Northern Arizona University (Rod.Parnell@nau.edu).



**Figure 6. Number of Projects by Project Type,
Colorado Plateau CESU, CYs 99-01
(N=183 Projects)**



**Figure 7. Number of Projects by Project Discipline,
Colorado Plateau CESU, CYs 99-01
(N=183 Projects)**

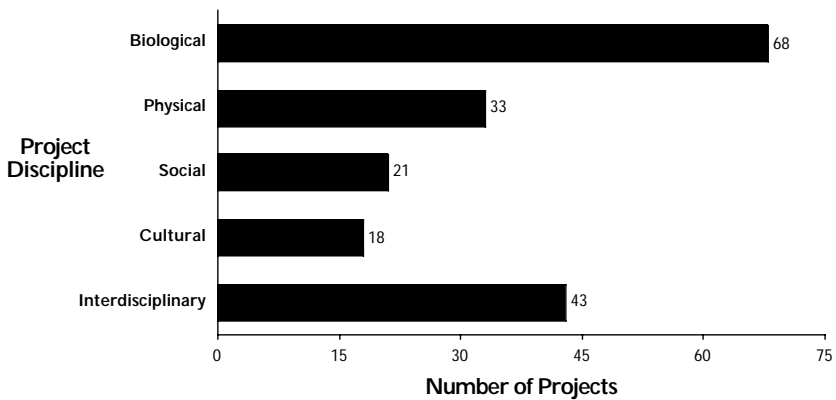


Figure 8. Number of Projects by Project Cost, Colorado Plateau CESU, CYs 99-01 (N=183 Projects; \$13.85 million)

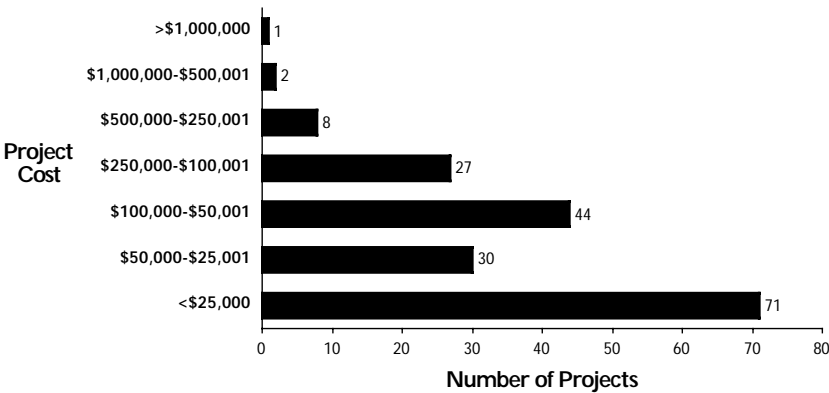
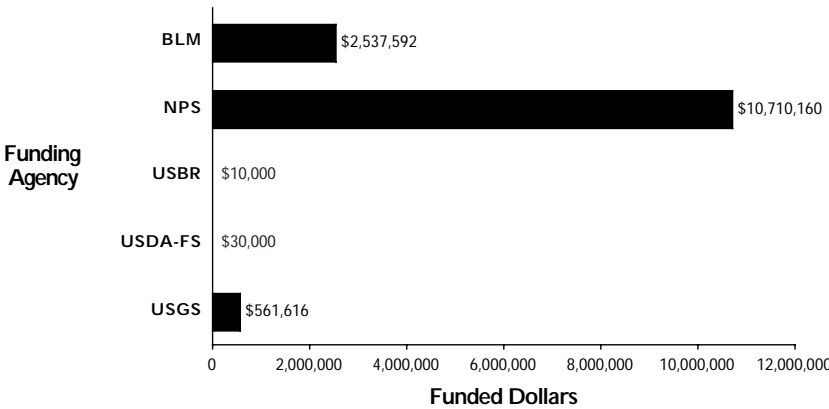


Figure 9. Funded Dollars by Funding Agency, Colorado Plateau CESU, CYs 99-01 (N=183 Projects; \$13.85 million)



Rocky Mountains CESU



The Rocky Mountains CESU is hosted by the University of Montana. The CESU became a member of the CESU Network in June 1999. The CESU host and partners represent Colorado, Idaho, Montana, Utah, Washington, and Wyoming. They include 4 federal agencies and 8 universities.

Federal Partners:

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service

Partner Institutions:

Montana State University
Salish Kootenai College
University of Colorado (Boulder and
Denver)
University of Idaho
University of Wyoming
Utah State University
Washington State University

The Rocky Mountains CESU mission statement declares that the focus of the CESU is:

to improve the scientific base for managing ecosystems in the rapidly changing social, cultural, and environmental landscape of the Rocky Mountain Region, and to extend its expertise to national issues where appropriate.

Given the rapidly expanding human populations within the Rocky Mountain region, the Rocky Mountains CESU provides opportunities for innovative and creative resource management supported by a solid foundation of scientific research. The Rocky Mountains CESU is a partnership that assists in the development and transmission of information to land managers through research, education, and technical assistance.

Summary of Projects and Activities

The Rocky Mountains CESU has completed its role and mission statement, strategic plan, annual workplan, and formation of its Managers Committee, all of which are posted on the CESU's website, <http://www.forestry.umn.edu/research/cesu/>.

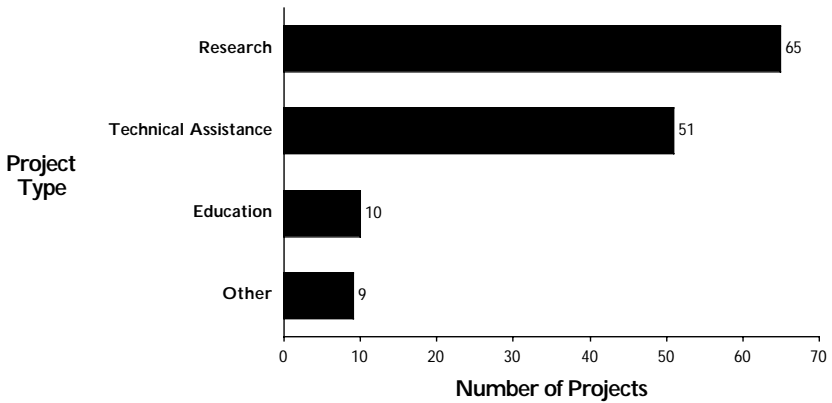
At the close of CY 2001, the Rocky Mountains CESU was responsible for 135 projects totaling \$6,148,000 in support funds (see Figures 10-13). 48% of the projects were research-oriented, 38% provided technical assistance, 7% focused on education, and 7% were general or "other." By scientific discipline, 40% of the projects involved the biological sciences, 20% involved the physical sciences, 10% involved the social sciences, 11% involved the cultural sciences, and 19% were general or interdisciplinary. Small projects of less than \$25,000 in support funds were most common (66%), while 34% of the projects in CYs 1999-01 were more than \$25,000 in cost. The National Park Service provided 50% of the total funds, the Bureau of Land Management provided 46%; other agencies collectively provided 4% of project costs.

Selected projects underway within the Rocky Mountains CESU focused on:

- studying historic fire regimes and change since European settlement on the Northern Mixed Prairie and their effects on ecosystem function and behavior (BLM),
- conducting surveys of invasive plants in Yellowstone National Park (NPS, USGS),
- assessing heavy metals contamination of soils in Grant-Kohrs Ranch National Historic Site (NPS),
- analyzing visitor use and related issues on the Upper Missouri River Corridor (BLM),
- documenting historic structures in Grant-Kohrs National Historic Site and Glacier National Park (NPS), and
- conducting a national study of the consequences of fire and fire surrogate treatments (BLM).

More information about the Rocky Mountains CESU is available at <http://www.forestry.umt.edu/research/cesu> and/or by contacting Dr. Perry J. Brown at the University of Montana (pbrown@forestry.umt.edu).

**Figure 10. Number of Projects by Project Type,
Rocky Mountains CESU, CYs 99-01
(N=135 Projects)**



**Figure 11. Number of Projects by Project Discipline,
Rocky Mountains CESU, CYs 99-01
(N=135 Projects)**

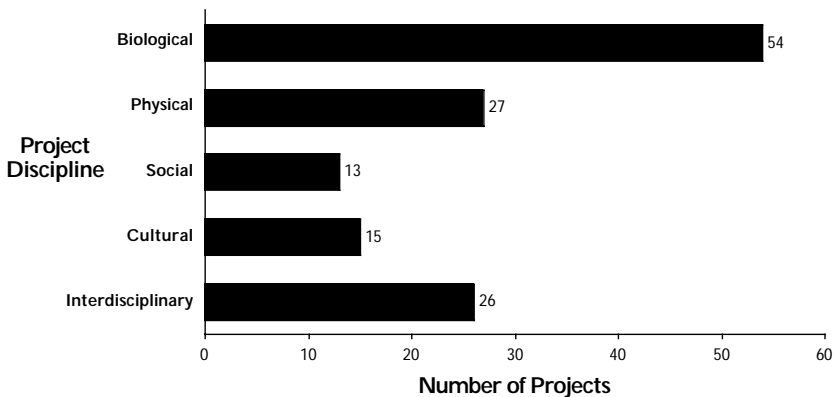


Figure 12. Number of Projects by Project Cost, Rocky Mountains CESU, CYs 99-01 (N=135 Projects; \$6.15 million)

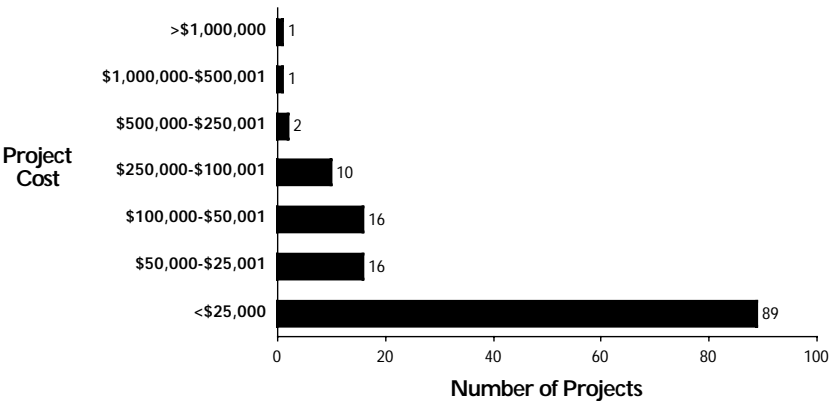
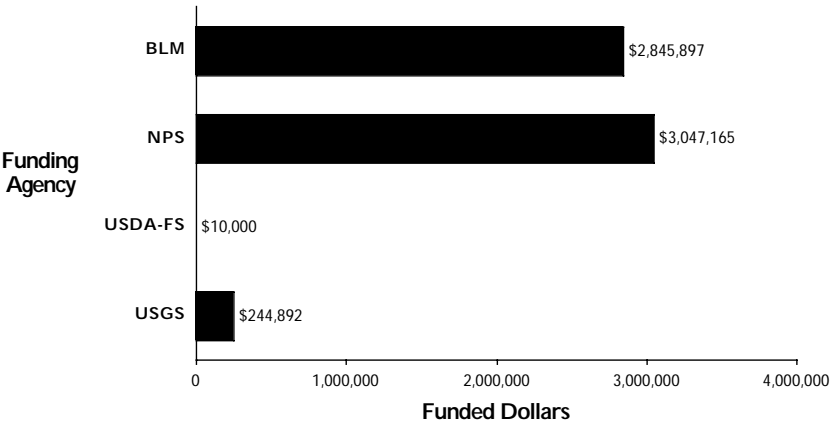


Figure 13. Funded Dollars by Funding Agency, Rocky Mountains CESU, CYs 99-01 (N=135 Projects; \$6.15 million)



Southern Appalachian Mountains CESU



The Southern Appalachian Mountains CESU is hosted by the University of Tennessee. The CESU became a member of the CESU Network in June 1999. The CESU host and partners represent Florida, North Carolina, South Carolina, and Tennessee. They include 4 federal agencies, 4 universities, 5 non-governmental organizations, and 1 national laboratory.

Federal Partners:

US Geological Survey
National Park Service
USDA Forest Service
Department of Energy

Partner Institutions:

Appalachian State University
Florida A&M University
Western Carolina University
Foothills Land Conservancy
Great Smoky Mountains
Conservation Association
Joint Institute for Energy and the
Environment
National Council for Air and Stream
Improvement
Oak Ridge National Laboratory
Southern Appalachian Man and Biosphere

The Southern Appalachian Mountains CESU is focused on addressing local and regional ecological issues, concerns, and needs faced by federal agency resource managers. In particular, projects undertaken by the CESU not only encompass the conservation of natural resources, but the interactive effects of such management actions on the economic, social, and cultural resources of the region. Broad-based initiatives of the CESU include, but are not limited to:

- restoration, augmentation, and monitoring of federally-listed species,
- strategic management and monitoring of exotic pest plants,

- carbon management related to climate change, and
- management of national park lands and resources.

Summary of Projects and Activities

The Southern Appalachian Mountains CESU has completed its strategic plan, role and mission statement, and annual workplan, which will be posted on the CESU's website, <http://cesu.ra.utk.edu>. Its Managers Committee has also been formed.

At the close of CY 2001, the Southern Appalachian Mountains CESU was responsible for 26 projects totaling \$686,000 in support funds (see Figures 14-17). 39% of the projects were research-oriented, 46% involved technical assistance, and 15% were general or "other." By scientific discipline, 62% of the projects involved the biological sciences, 4% involved the social sciences, 15% involved the cultural sciences, and 19% were general or interdisciplinary. Small projects of less than \$25,000 in support funds were most common (73%), while 37% of the projects in CYs 1999-01 were more than \$25,000. The National Park Service provided 80% of the total project funds, the USDA-Forest Service provided 17%; other agencies collectively provided 3% of project costs.

Selected projects underway within the Southern Appalachian Mountains CESU focused on:

- understanding the effects of river otter reintroduction on muskrat and mussel populations at Mammoth Cave National Park (NPS, USGS),
- predicting avifaunal distributions in response to climate change in the southern Blue Ridge Physiographic Province, Pisgah-Nantahala National Forests (USDA-FS),
- identifying the socio-economic implications of bear repatriation in Big South Fork National River & Recreation Area (NPS, USGS), and
- restoring and transcribing oral history tapes related to the Big South Fork National River & Recreation Area (NPS).

More information about the Southern Appalachian Mountains CESU is available at <http://cesu.ra.utk.edu> and/or by contacting Dr. George Hopper (ghopper@utk.edu) or Dr. Ray Albright (ralbrigh@utk.edu, or ray_albright@nps.gov) at the University of Tennessee.

Figure 14. Number of Projects by Project Type, Southern Appalachian Mountains CESU, CYs 99-01 (N=26 Projects)

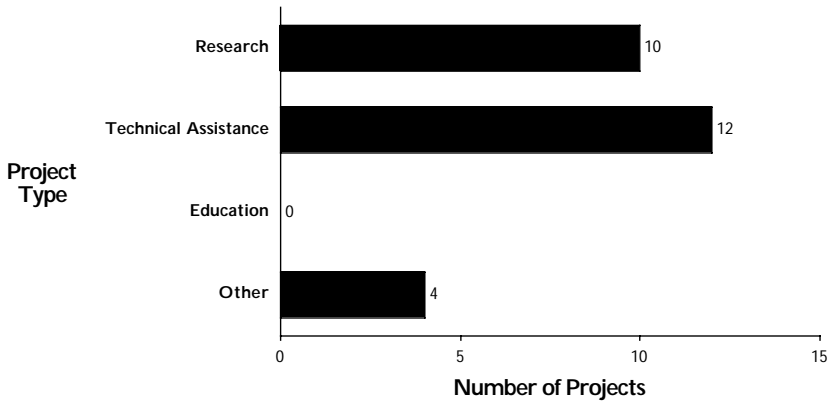
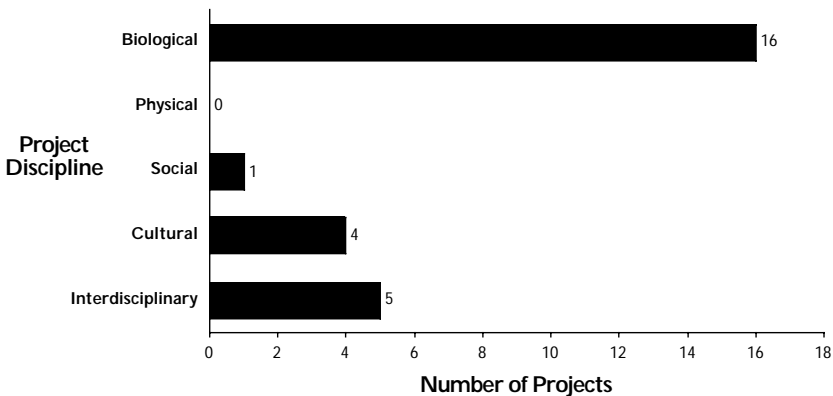
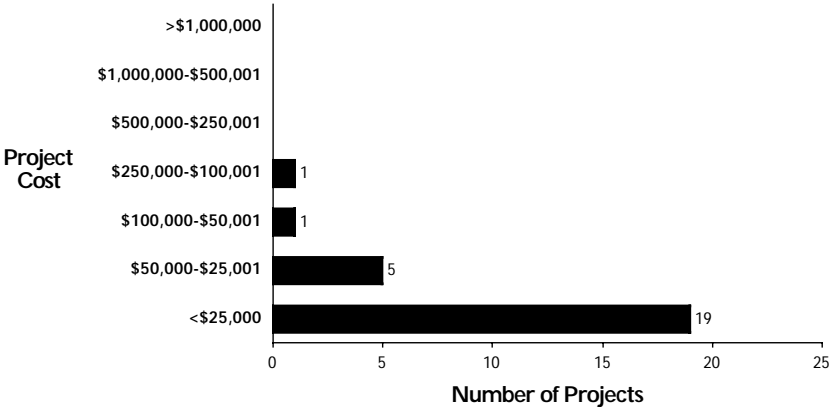


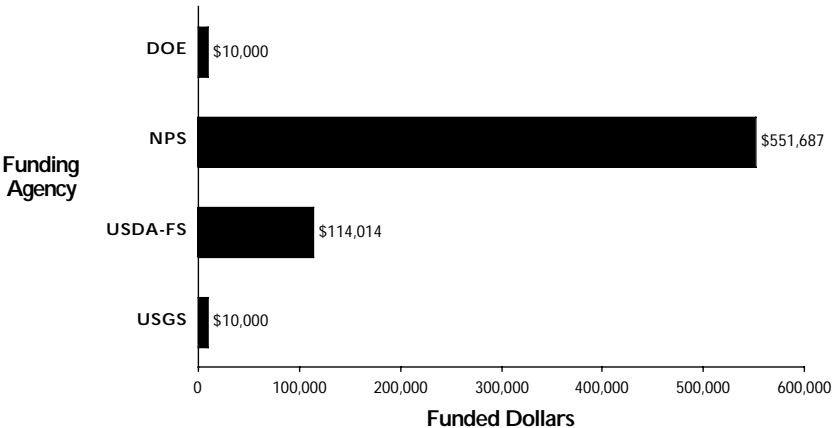
Figure 15. Number of Projects by Project Discipline, Southern Appalachian Mountains CESU, CYs 99-01 (N=26 Projects)



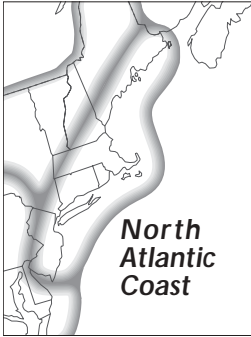
**Figure 16. Number of Projects by Project Cost,
Southern Appalachian Mountains CESU, CYs 99-01
(N=26 Projects; \$0.69 million)**



**Figure 17. Funded Dollars by Funding Agency,
Southern Appalachian Mountains CESU, CYs 99-01
(N=26 Projects; \$0.69 million)**



North Atlantic Coast CESU



The North Atlantic Coast CESU is hosted by the University of Rhode Island. The CESU became a member of the CESU Network in June 1999. The CESU host and partners represent Maryland, Massachusetts, New Jersey, and Rhode Island. They include 2 federal agencies, and 4 universities.

Federal Partners:

US Geological Survey
National Park Service

Partner Institutions:

Rutgers University
University of Maryland - Eastern Shore
University of Massachusetts - Amherst

Activities within the North Atlantic Coast CESU encompass all ecosystems of coastal watersheds, including barrier islands, estuaries, nearshore oceanic environments, salt and freshwater wetlands, coastal ponds, as well as the processes affecting coastal environments. Critical issues confronting resource managers include, but are not limited to:

- shoreline erosion,
- nutrient enrichment and eutrophication,
- accelerated sea level rise and climate change,
- invasion of exotic species,
- overexploitation of renewable resources,
- vector-borne diseases and insect pests, and
- loss of habitat quality and biodiversity.

Projects within the North Atlantic Coast CESU investigate the fundamental ecosystem processes affected by these issues, develop resource management solutions based on sound science and an

appreciation for societal needs, and monitor the effectiveness of those solutions.

Summary of Projects and Activities

The strategic plan and role and mission statement for the North Atlantic Coast CESU have been completed and posted on the CESU's website, <http://www.ci.uri.edu/projects/cesu>. Both the Managers Committee and the annual workplan for 2001 are complete, but are not yet posted.

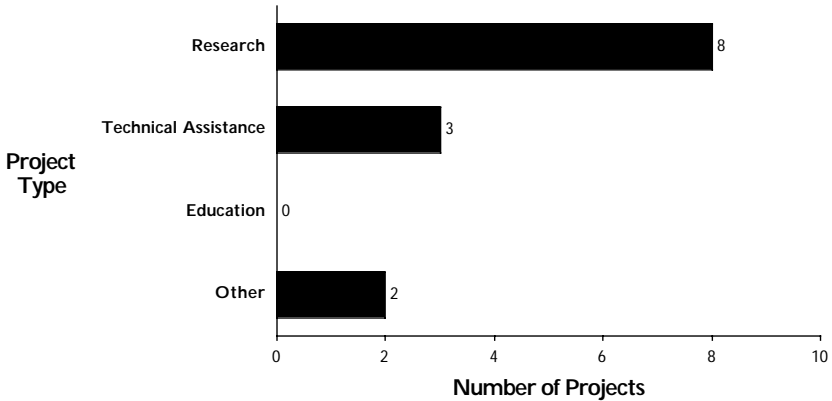
At the close of CY 2001, the North Atlantic Coast CESU was responsible for 13 projects totaling \$726,000 in support funds (see Figures 18-21). 62% of the projects were research-oriented, 23% involved technical assistance, and 15% were general or "other." By scientific discipline, 31% of the projects involved each of the biological and physical sciences, and 38% were general or interdisciplinary. Projects between \$50,001 and \$100,000 in support funds were most frequent (54%), while 46% of the projects in CYs 1999-01 were less than \$50,000 in cost. The National Park Service provided 99% of the total project funding, and the US Geological Survey provided 1% of project costs.

Selected projects underway within the North Atlantic Coast CESU focused on:

- studying the distribution of mosquito species associated with West Nile encephalitis and conducting surveys of potential breeding habitat in National Park Service units in the northeastern US (NPS, USGS),
- conducting an environmental contaminants baseline inventory and monitoring for northeast national parks (NPS, EPA),
- identifying the influence of geologic frameworks on shoreline retreat rates in Assateague Island National Seashore (NPS, USGS), and
- assessing trends in contaminant inputs and cultural eutrophication in Cape Cod National Seashore and Acadia National Park (NPS, USGS, EPA).

More information about the North Atlantic Coast CESU is available at <http://www.ci.uri.edu/projects/cesu> and/or by contacting Dr. Peter V. August at the University of Rhode Island (pete@edc.uri.edu).

**Figure 18. Number of Projects by Project Type,
North Atlantic Coast CESU, CYs 99-01
(N=13 Projects)**



**Figure 19. Number of Projects by Project Discipline,
North Atlantic Coast CESU, CYs 99-01
(N=13 Projects)**

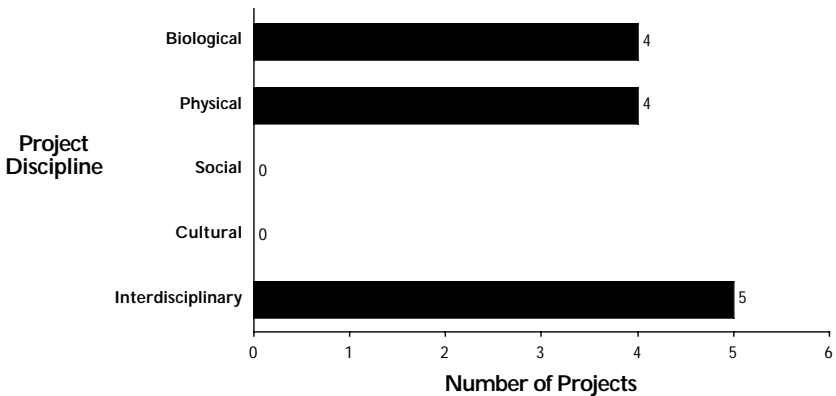


Figure 20. Number of Projects by Project Cost,
North Atlantic Coast CESU, CYs 99-01
(N=13 Projects; \$0.73 million)

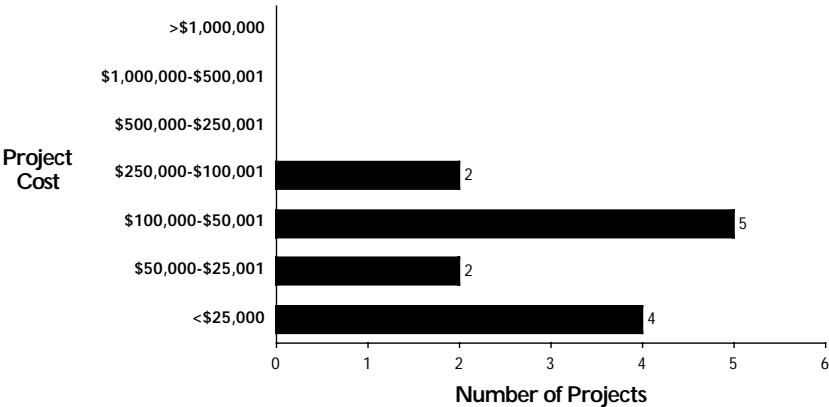
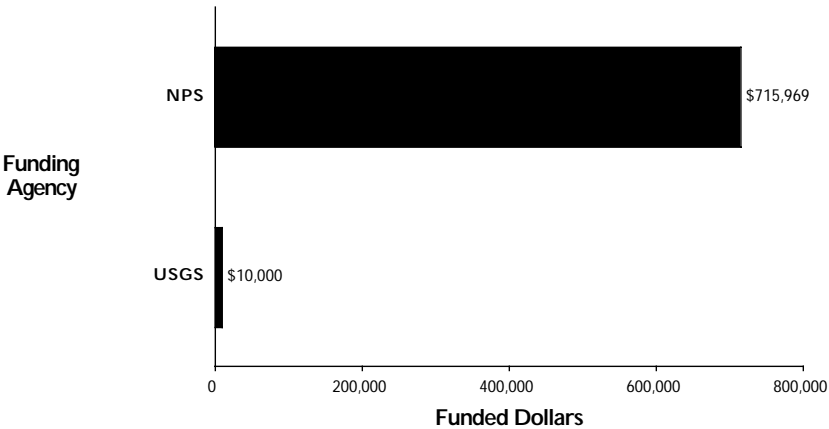


Figure 21. Funded Dollars by Funding Agency,
North Atlantic Coast CESU, CYs 99-01
(N=13 Projects; \$0.73 million)



Pacific Northwest CESU



The Pacific Northwest CESU is hosted by the University of Washington. The CESU became a member of the CESU Network in October 2000. The CESU host and partners represent Alabama, Alaska, Idaho, Oregon, Vermont, Washington, and British Columbia. They include 5 federal agencies, 12 universities, and 1 state agency.

Federal Partners:

Bureau of Land Management
US Fish and Wildlife Service
US Geological Survey
National Park Service
USDA Forest Service

Partner Institutions:

Heritage College
Oregon State University
Tuskegee University
University of Alaska - Anchorage
University of Alaska - Southeast
University of British Columbia
University of Idaho
University of Oregon
University of Vermont
Washington State University
Western Washington University
Alaska Department of Fish and Game

Projects and activities within the Pacific Northwest CESU occur within a diverse array of ecosystems including terrestrial, riparian, and coastal environments that contain old and young temperate rainforests, near-shore oceanic environments, volcanically-derived mountain ranges, the arid Columbia Basin plateau, and the Alaska subarctic tundra. Many areas within the CESU are experiencing rapid population and economic growth, presenting challenges for public resource managers. Projects within the CESU address numerous complex resource management issues such as:

- developing protocols for estimating recreational fishery harvests,

- restoring at-risk ecosystems,
- developing strategies for conserving biodiversity,
- reclaiming damaged lands,
- identifying subsistence and other traditional uses of federal lands by Native Americans and residents of rural communities,
- controlling exotic species,
- monitoring impacts from visitor and recreational use, and
- evaluating impacts to threatened and endangered species.

Summary of Projects and Activities

The strategic plan, role and mission statement, and annual workplan for the Pacific Northwest CESU have been completed. The Managers Committee is being formed, and will be finalized in 2002. This information will be posted on the CESU's website, <http://www.cfr.washington.edu/research.cesu>.

At the close of CY 2001, the Pacific Northwest CESU was responsible for 41 projects totaling \$1,118,000 in support funds (see Figures 22-25). 63% of the projects were research-oriented, 17% involved technical assistance, 3% focused on education, and 17% were general or "other." By scientific discipline, 34% of the projects involved the biological sciences, 7% involved the physical sciences, 10% involved the social sciences, 22% involved the cultural sciences, and 27% were general or interdisciplinary. Small projects of less than \$25,000 in support funds were most common (76%), while 24% of the projects in CYs 2000-01 were between \$25,001 and \$250,000 in cost. The National Park Service provided 91% of the total project funds, the Bureau of Land Management provided 7%; other agencies collectively provided 2% of project costs.

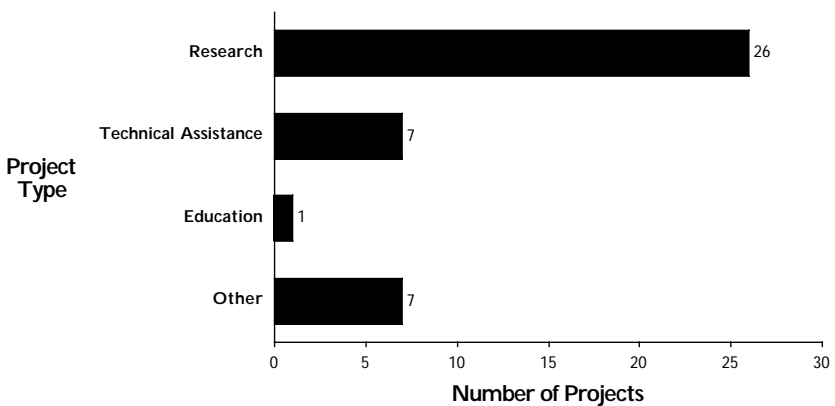
Selected projects within the Pacific Northwest CESU focused on:

- assessing the impact of soil erosion on the declining Sockeye salmon population in Lake Ozette, Washington, Olympic National Park (NPS),

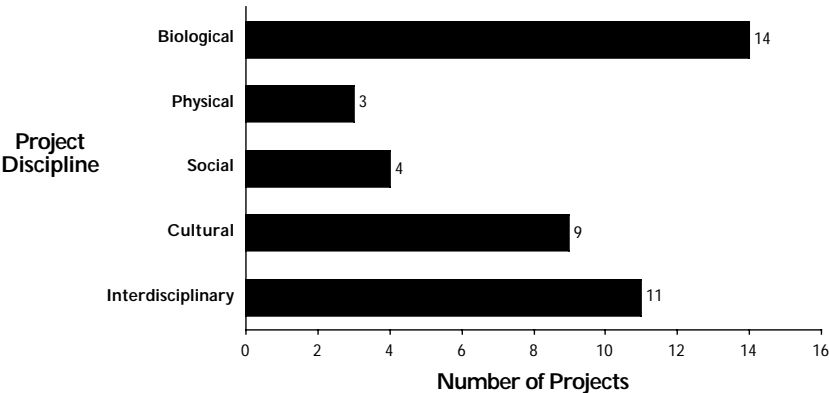
- studying the paleoecology of the plains of Fort Vancouver National Historic Site and Olympic National Park (NPS),
- describing traditional uses of Aniakchak National Monument and Preserve (NPS),
- conducting an ethnographic overview and assessment of Klondike Goldrush National Historical Park (NPS),
- conducting ethnographies of the Chitna and Noatak Rivers, Alaska (NPS, Alaska Dept. of Fish and Game), and
- implementing a human-bear management plan in the North Cascades National Park (NPS).

More information about the Pacific Northwest CESU is available at <http://www.cfr.washington.edu/research.cesu> and/or by contacting Dr. Gordon Bradley (gbradley@u.washington.edu) or Darryll Johnson (darryllj@u.washington.edu) at the University of Washington.

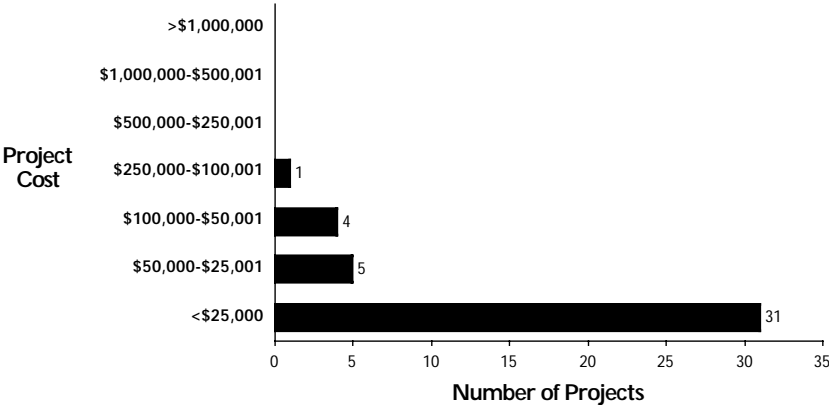
**Figure 22. Number of Projects by Project Type,
Pacific Northwest CESU, CYs 00-01
(N=41 Projects)**



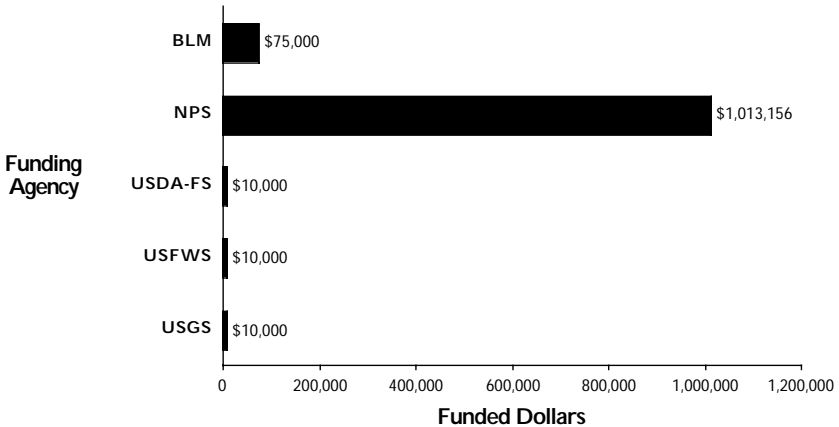
**Figure 23. Number of Projects by Project Discipline,
Pacific Northwest CESU, CYs 00-01
(N=41 Projects)**



**Figure 24. Number of Projects by Project Cost,
Pacific Northwest CESU, CYs 00-01
(N=41 Projects; \$1.12 million)**



**Figure 25. Funded Dollars by Funding Agency,
Pacific Northwest CESU, CYs 00-01
(N=41 Projects; \$1.12 million)**



Desert Southwest CESU



The Desert Southwest CESU is hosted by the University of Arizona. The CESU became a member of the CESU Network in October 2000. The CESU host and partners represent Arizona, California, District of Columbia, New Mexico, Nevada, and Texas. They include 5 federal agencies, 5 universities, and 2 non-governmental organizations.

Federal Partners:

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service

Partner Institutions:

Howard University
New Mexico State University
Southwest Texas State University
University of California - Riverside

Department of Defense

Arizona-Sonora Desert Museum
Sonoran Institute

The Desert Southwest CESU biogeographic region encompasses multiple urban centers and spans three desert regions — Chihuahuan, Sonoran, and Mojave — characterized by high temperatures and aridity. Biotic diversity is influenced by elevation differences that range from below sea-level in the Mojave to mountains exceeding 12,000 feet in the Chihuahuan Desert. The Desert Southwest provides habitat for many species that are threatened and endangered. The presence of invasive and exotic species also complicates management practices. Although grazing has been substantially reduced in desert low lands, these ecosystems have been slow to recover. Desert environments lead the nation in population growth, and the desert/urban interface creates new challenges for the development of sustainable management strategies. The sizable Native and Latin American constituency of the region and its southern border with Mexico offer many multicultural opportunities for collaborative efforts and ecosystem-wide approaches to shared challenges within the region.

Summary of Projects and Activities

The Desert Southwest CESU has completed its strategic plan, role and mission statement, annual workplan, and the Managers Committee is in place. This information will be posted on the CESU's website, <http://ag.arizona.edu/srnr/dscesu/>.

At the close of CY 2001, the Desert Southwest CESU was responsible for 45 projects totaling \$1,681,000 in support funds (see Figures 26-29). 62% of the projects were research-oriented, 20% involved technical assistance, 7% focused on education, and 11% were general or "other." By scientific discipline, 56% of the projects involved the biological sciences, 13% involved the physical sciences, 2% involved the social sciences, 5% involved the cultural sciences, and 24% were general or interdisciplinary. Small projects of less than \$25,000 in support funds were most common (64%), while 36% of the projects in CYs 2000-01 were between \$25,001 and \$250,000 in cost. The National Park Service

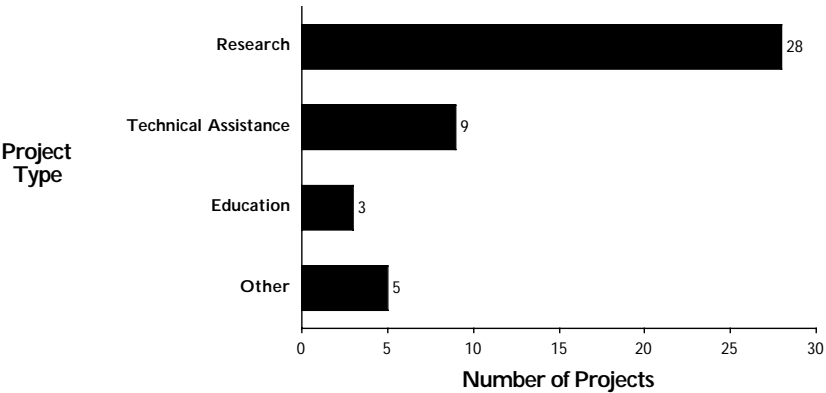
provided 55% of the total project funds, the Bureau of Land Management provided 43%; other agencies collectively provided 2% of project costs.

Selected projects within the Desert Southwest CESU focused on:

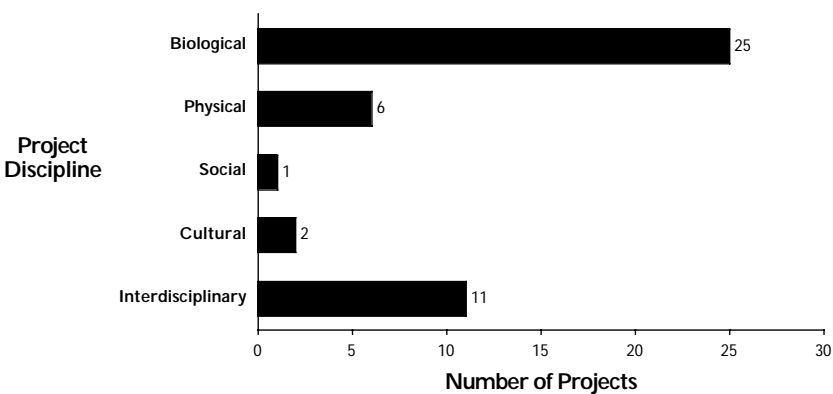
- studying environmental contaminants in potential prey of Peregrine Falcons (NPS, USGS),
- developing a park flight migratory bird conservation program (NPS),
- identifying and mapping water sources at riparian areas in Saguaro National Park (NPS, Sonoran Institute),
- conducting an access and travel route inventory and recreation use study in Ironwood Forest National Monument (BLM),
- conducting an inventory of cultural resources of the Ironwood Forest National Monument and collecting field, archival, and historic information pertaining to the Mission Santa Ana de Cuiquiburitac (BLM), and
- studying Sonoran Desert Tortoise ecology and management and the effects of land-use change and urbanization on desert populations (NPS, USGS).

More information about the Desert Southwest CESU is available at <http://ag.arizona.edu/srnr/dscesu/> and/or by contacting Dr. C.P.P. Reid (cprr@ag.arizona.edu), Dr. Lloyd Gay (lgay@ag.arizona.edu), or Kathleen Docherty (docherty@ag.arizona.edu) at the University of Arizona.

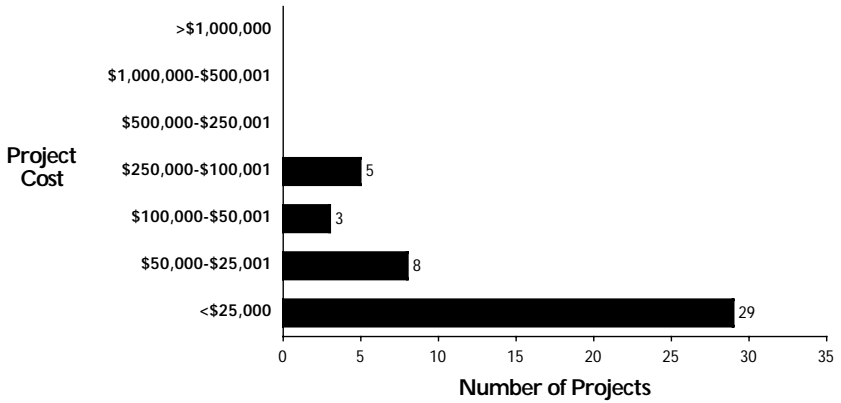
**Figure 26. Number of Projects by Project Type,
Desert Southwest CESU, CYs 00-01
(N=45 Projects)**



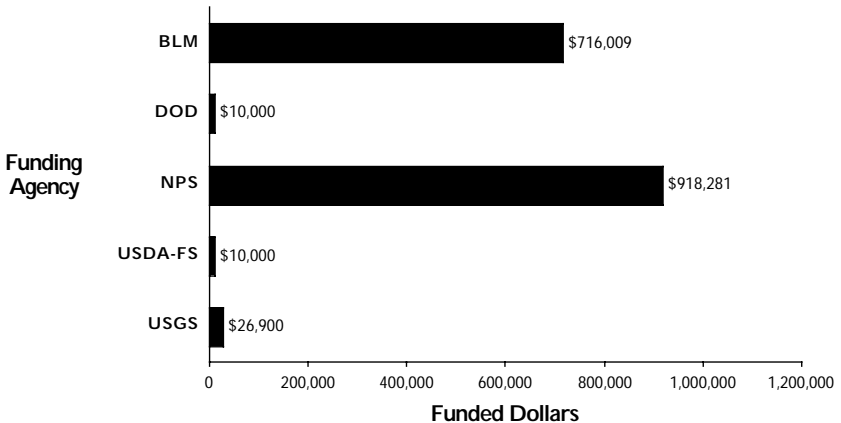
**Figure 27. Number of Projects by Project Discipline,
Desert Southwest CESU, CYs 00-01
(N=45 Projects)**



**Figure 28. Number of Projects by Project Cost,
Desert Southwest CESU, CYs 00-01
(N=45 Projects; \$1.68 million)**



**Figure 29. Funded Dollars by Funding Agency,
Desert Southwest CESU, CYs 00-01
(N=45 Projects; \$1.68 million)**



Great Plains CESU



The Great Plains CESU is hosted by the University of Nebraska. The CESU became a member of the CESU Network in October 2000. The CESU host and partners represent Colorado, Minnesota, Nebraska, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. They include 5 federal agencies, and 11 universities.

Federal Partners:

Bureau of Land Management
Bureau of Reclamation
US Geological Survey
National Park Service
USDA Forest Service

Partner Institutions:

Colorado State University
Langston University
Little Priest Tribal College
South Dakota State University
Texas A&M University
University of Minnesota
University of North Dakota
University of Oklahoma
University of South Dakota
University of Wyoming

The Great Plains CESU Mission Statement declares that the goal of the Great Plains CESU is:

to determine the ecological state of public lands within the Great Plains and examine its future within the context of private lands.

Areas of strategic concern within the CESU include:

- biological invasions and their impact on existing ecosystem integrity,
- habitat fragmentation for threatened and endangered species,

- effects on the health of wetlands, lakes, streams, and rivers from agrochemicals, nutrients, etc.,
- preservation and/or restoration of native aquatic and terrestrial communities,
- social and cultural values of natural areas under changing population and land use,
- timely transfer and access of information for resource management and policy,
- implications of global environmental change on managed and unmanaged ecosystems, and
- implications of land-use change on ecosystem integrity.

Summary of Projects and Activities

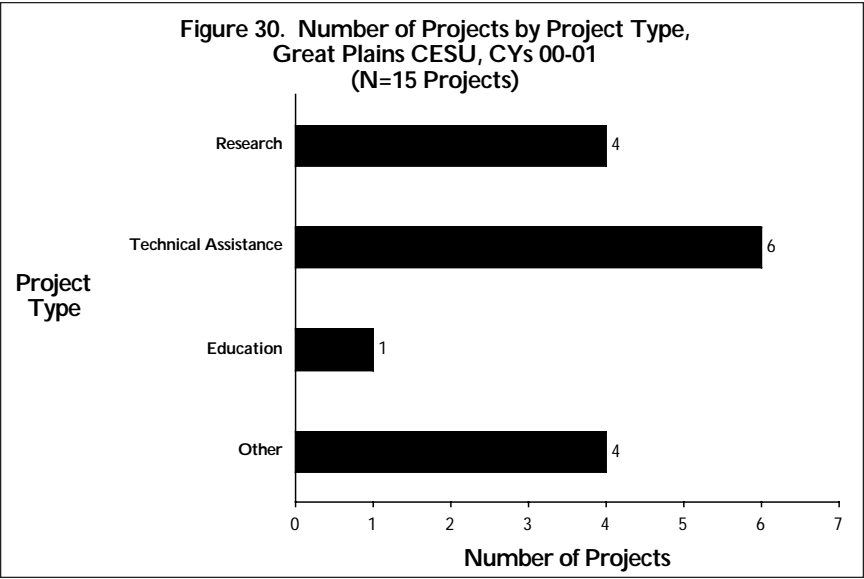
The role and mission statement for the Great Plains CESU has been completed, and is posted on the CESU's website, <http://greatplains.cesu.unl.edu>. The strategic plan, annual workplan, and Managers Committee are under development, and will be posted on the CESU's website upon completion.

At the close of CY 2001, the Great Plains CESU was responsible for 15 projects totaling \$280,000 in support funds (see Figures 30-33). 27% of the projects were research-oriented, 40% provided technical assistance, 6% involved education, and 27% were general or "other." By scientific discipline, interdisciplinary and biological sciences each represented 27% of the projects, while the physical and social sciences each represented 20% of the projects, and 6% involved the cultural sciences. Small projects of less than \$25,000 in support funds were most common (80%), while 20% of the projects in CYs 2000-01 were between \$25,001 and \$100,000 in cost. The National Park Service provided 85% of the total project funds, and other federal agencies collectively provided 15% of project costs.

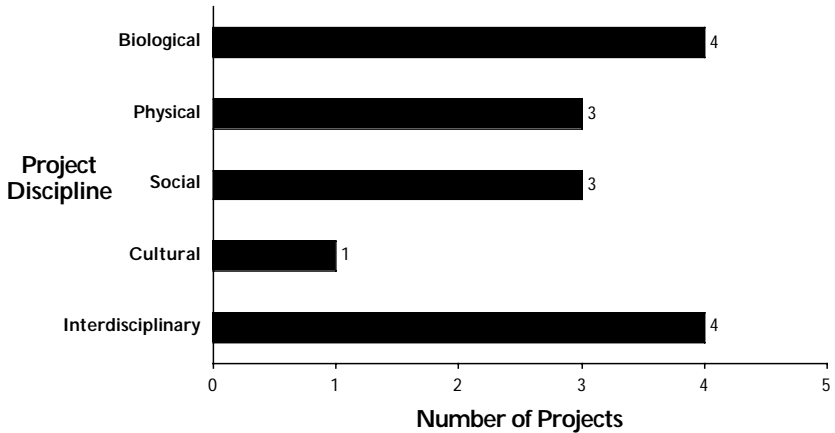
Selected projects within the Great Plains CESU focused on:

- restoring Resaca Wetlands and associated wet prairie habitats (NPS),
- scoping and developing a methodology for preparing Voyageurs National Park’s visitor experience and resource protection plan (NPS), and
- exploring meaning and values at Apostle Islands National Lakeshore (NPS).

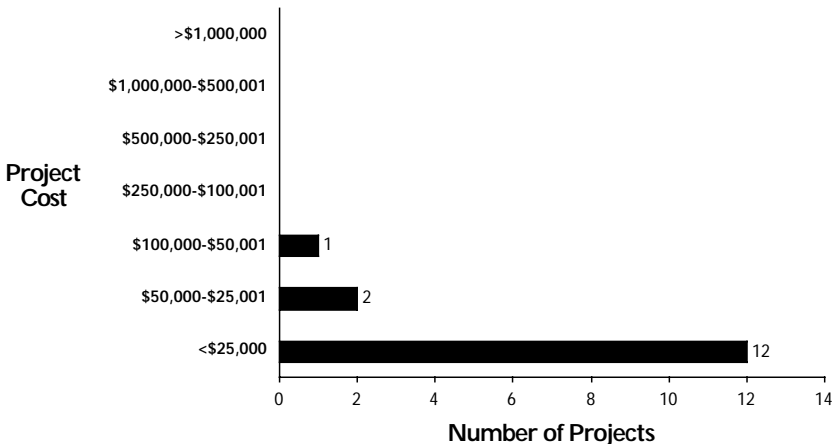
More information about the Great Plains CESU is available at <http://greatplains.cesu.unl.edu> and/or by contacting Dr. Kyle Hoagland (khoagland@unl.edu) or Christine Lockert (clockert2@unl.edu) at the University of Nebraska - Lincoln.

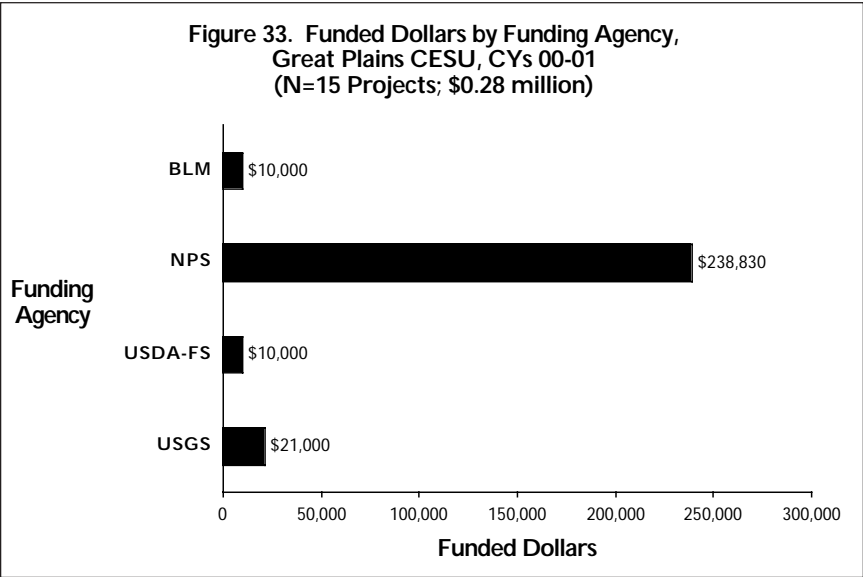


**Figure 31. Number of Projects by Project Discipline,
Great Plains CESU, CYs 00-01
(N=15 Projects)**

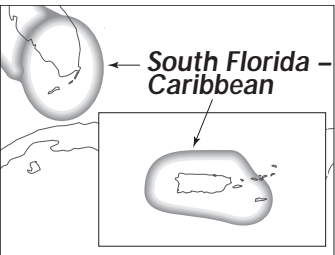


**Figure 32. Number of Projects by Project Cost,
Great Plains CESU, CYs 00-01
(N=15 Projects; \$0.28 million)**





South Florida – Caribbean CESU



The South Florida-Caribbean CESU is hosted by the University of Miami. The CESU became a member of the CESU Network in October 2000. The CESU host and partners represent Florida, North Carolina, Puerto Rico, and the US Virgin Islands. They include 3 federal agencies, 9 universities, and 1 non-governmental organization.

Federal Partners:
Bureau of Land Management
US Geological Survey
National Park Service

Partner Institutions:
Barry University
Florida A&M University
Florida Atlantic University
Nova Southeastern University

University of Florida
University of North Carolina -
Wilmington
University of Puerto Rico
University of the Virgin Islands
Audubon of Florida

The South Florida-Caribbean CESU is focused on the study and management of the unique and diverse marine, coastal, and terrestrial ecosystems of the region, including subtropical forests, estuaries and nearshore oceanic environments, salt and freshwater wetlands and mangroves, terrestrial wetlands (Everglades), and coral reefs. The connection between these environments is reflected in the flow of water from the land to the sea. This connection, the resulting geological, hydrological, biological, and ecological manifestations, and an expanding human presence provide the principal set of interacting scientific and socio-economic issues for the South Florida-Caribbean CESU.

Summary of Projects and Activities

The South Florida-Caribbean CESU has completed its role and mission statement, and its strategic plan. Both documents are available on the CESU's website, <http://mgg.rsmas.miami.edu/sfcesu/index.htm>. The Managers Committee and the annual workplan are being assembled, and will be posted on the CESU's website upon completion.

At the close of CY 2001, the South Florida-Caribbean CESU was responsible for 35 projects totaling \$1,770,000 in support funds (Figures 34-37). 57% of the projects were research-oriented, 34% provided technical assistance, and 9% were general or "other." By scientific discipline, 66% of the projects involved the biological sciences, 11% involved the physical sciences, 6% involved the social sciences, and 17% were general or interdisciplinary. Although small projects of less than \$25,000 in support funds were common (46%), 54% of the projects in CYs 2000-01 were between \$25,001 and \$500,000 in cost. The National Park Service provided 93% of the total project funds, and other federal agencies collectively provided 7% of project costs.

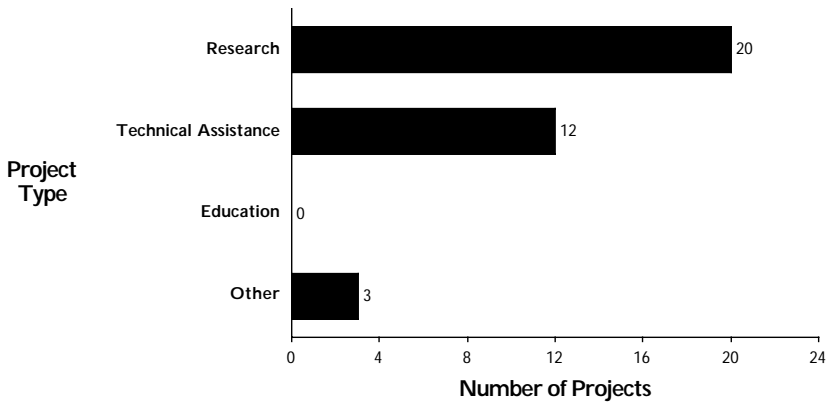
Selected projects within the South Florida-Caribbean CESU focused on:

- mapping and characterizing aquatic refugia in Everglades National Park and Loxahatchee National Wildlife Refuge (NPS, USGS, USFWS),
- restoring wetlands at Lameshur Bay, Virgin Islands National Park (NPS),
- assessing the relative distribution, abundance, and demographic structure of the American alligator in relation to habitat, water levels and salinities (NPS, USGS, USFWS),
- developing a land-based propagation facility for ecologically important reef corals (NPS),
- assessing fish utilization of mangrove fringe habitats within Biscayne National Park and adjacent waters (NPS, USGS, Audubon of Florida), and
- understanding the water demands, economic growth, and economic impacts of the CERP program (NPS).

More information about the South Florida-Caribbean CESU is available at <http://mgg.rsmas.miami.edu/sfcesu/index.htm> and/or by contacting Dr. Peter K. Swart at the University of Miami (pswart@rsmas.miami.edu).



**Figure 34. Number of Projects by Project Type,
South Florida-Caribbean CESU, CYs 00-01
(N=35 Projects)**



**Figure 35. Number of Projects by Project Discipline,
South Florida-Caribbean CESU, CYs 00-01
(N=35 Projects)**

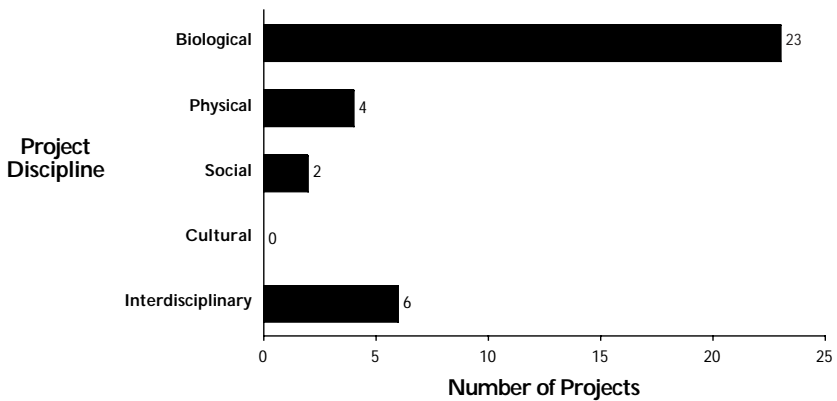


Figure 36. Number of Projects by Project Cost, South Florida-Caribbean CESU, CYs 00-01 (N=35 Projects; \$1.77 million)

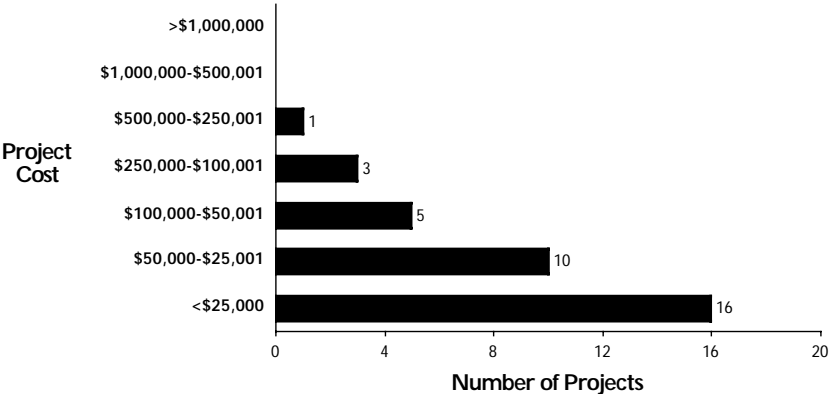
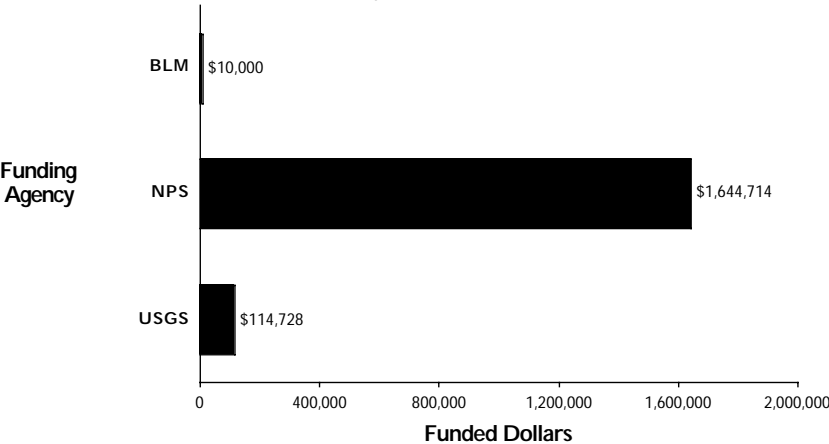
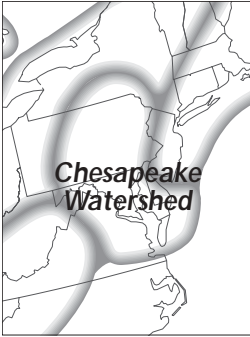


Figure 37. Funded Dollars by Funding Agency, South Florida-Caribbean CESU, CYs 00-01 (N=35 Projects; \$1.77 million)



Chesapeake Watershed CESU



The Chesapeake Watershed CESU is hosted by the University System of Maryland (participating through 4 of its 13 institutions: University of Maryland Center for Environmental Science, University of Maryland-Baltimore County, University of Maryland-College Park, and Frostburg State University). The CESU is headquartered at the Appalachian Laboratory of the University of Maryland Center for Environmental Science. The CESU became a

member of the CESU Network in August 2001. The CESU host and partners represent the District of Columbia, Maryland, Pennsylvania, and Virginia. They include 4 federal agencies and 8 universities.

Federal Partners:

Bureau of Land Management
US Geological Survey
National Park Service
Department of Defense

Partner Institutions:

George Mason University
Pennsylvania State University
University of the District of Columbia
University of Virginia

The Chesapeake Watershed CESU is the only CESU in the Network whose boundaries coincide with those of a major watershed. The watershed encompasses two large metropolitan areas, extensive suburban development, major agricultural zones, large areas of forested land, as well as the estuarine habitats of the Chesapeake Bay. The high human population density within the watershed results in a diversity of environmental stresses. The Chesapeake Watershed CESU contributes to the wise management of the watershed and its resources in this urbanizing landscape by supporting activities in:

- understanding watershed processes as influenced by landscape patterns and changes,
- natural and cultural resources and heritage,
- ecosystem management of urban and urbanizing landscapes,

- human-environment relationships,
- public lands stewardship,
- assessing external stresses from influences such as climate change, exotic species, transboundary pollution, and
- tools for enhancing stewardship.

Summary of Projects and Activities

The role and mission statement for the Chesapeake Watershed CESU has been completed. The strategic plan, annual workplan, and Managers Committee are under development. The website is under construction.

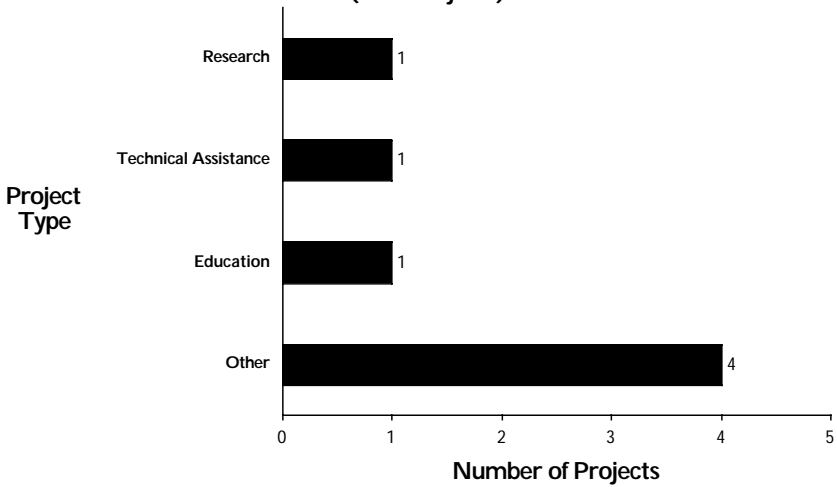
At the close of CY 2001, the Chesapeake Watershed CESU was responsible for 7 projects totaling \$459,000 in support funds (see Figures 38-41). 14% of the projects were classified in each of research, technical assistance, and education, and 58% were general or "other." By scientific discipline, 14% involved the biological sciences and 86% of the projects were general or interdisciplinary. Although small projects of less than \$25,000 in support funds were common (43%), projects in CY 2001 that were between \$25,001 and \$250,000 in cost were more frequent (57%). The National Park Service provided 77% of the total project funds, the Bureau of Land Management provided 19%; other federal agencies collectively provided 4% of project costs.

Selected projects within the Chesapeake Watershed CESU focused on:

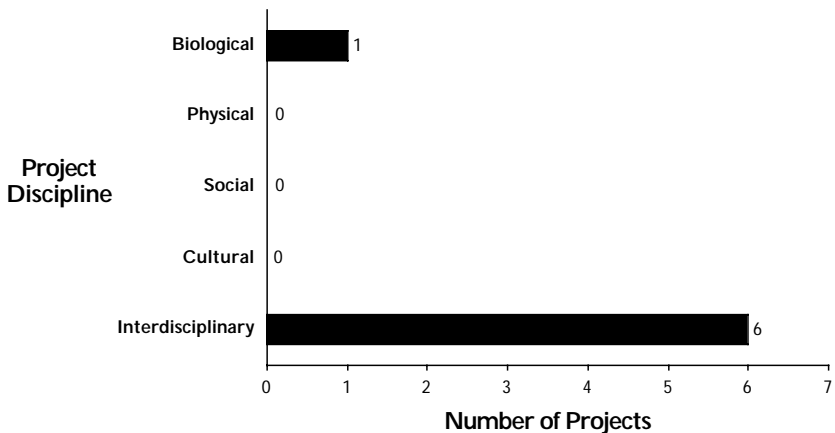
- conducting workshops on restoring the American Chestnut to national parks (NPS), and
- performing mammal surveys in George Washington Birthplace National Monument, Thomas Stone National Historic Site, and Colonial National Historical Park (NPS).

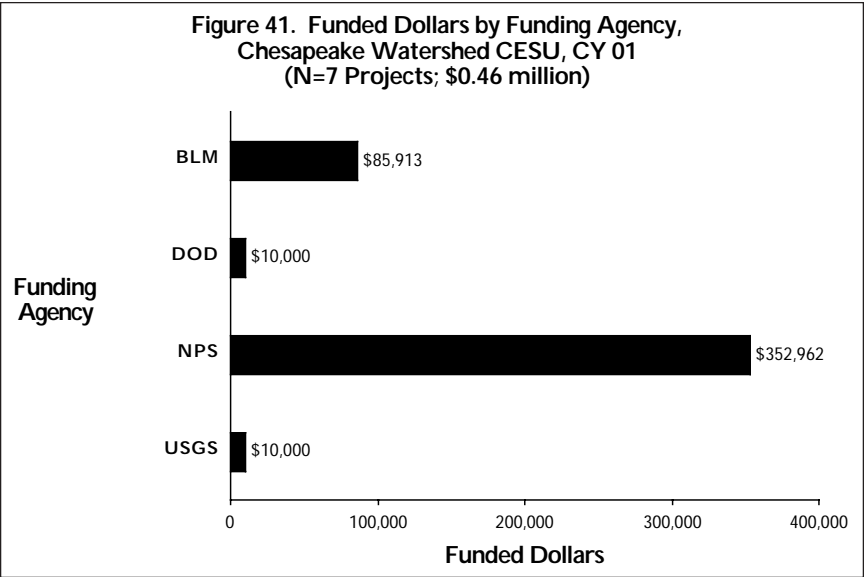
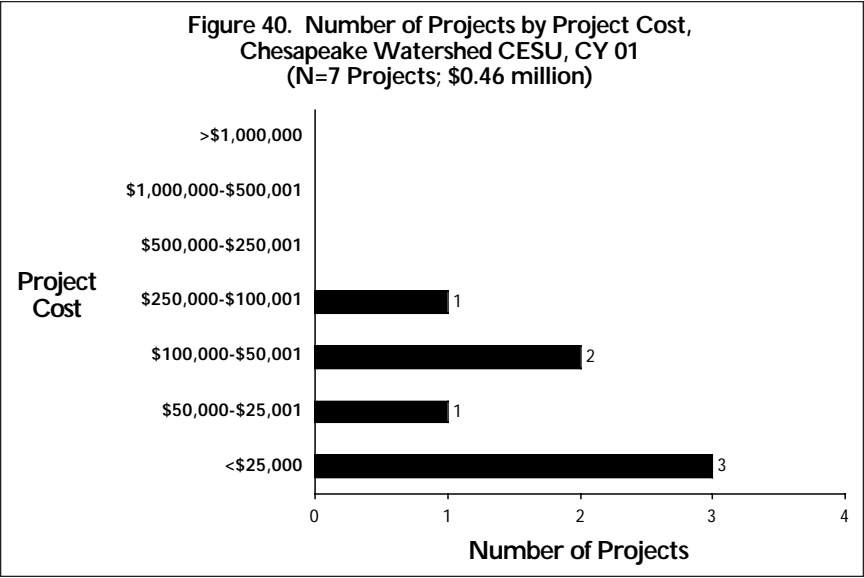
More information about the Chesapeake Watershed CESU is available by contacting Dr. Louis F. Pitelka (pitelka@al.umces.edu) at the University of Maryland Center for Environmental Science, Appalachian Laboratory.

**Figure 38. Number of Projects by Project Type,
Chesapeake Watershed CESU, CY 01
(N=7 Projects)**



**Figure 39. Number of Projects by Project Discipline,
Chesapeake Watershed CESU, CY 01
(N=7 Projects)**





Great Basin CESU



The Great Basin CESU is hosted by the University of Nevada-Reno. The CESU became a member of the CESU Network in August 2001. The CESU host and partners represent California, Idaho, Kansas, Nevada, Oregon, and Utah. They include 4 federal agencies, 9 universities, and 2 non-governmental organizations.

Federal Partners:

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service

Partner Institutions:

D-Q University
Great Basin College
Haskell Indian Nations University
Idaho State University
Oregon State University
University of Nevada - Las Vegas
University of Utah
Utah State University
Desert Research Institute
White Mountain Research Station

The Great Basin CESU is located in the heart of the western United States. The Great Basin contains mountain ranges, semi-arid foothills, arid valley rangelands, riparian wetlands, and desert playas.

Although scarce in water, the region contains rich deposits of minerals and geothermal resources. Human population growth and urbanization in the Great Basin are among the most rapid in the nation. Coupled with some of the nation's highest per capita incomes, this growth increases pressure on recreation and cultural resources, and complicates management. The Great Basin CESU focuses its efforts on issues related to the rapid loss of ecosystems and associated plant and animal species across the region, and on the prudent science-based courses of action that consider the scales of time and space within which the ecosystems

operate. Ongoing research issues include, but are not limited to:

- fire ecology and post-fire rehabilitation,
- inventory of ecosystem conditions,
- effects of invasive plant species on native populations and ecosystem processes,
- decline in populations of threatened species and associated restoration issues,
- protecting and preserving human and cultural resources, and
- water and soil conservation issues.

Summary of Projects and Activities

The role and mission statement and the Managers Committee for the Great Basin CESU have been completed, while the strategic plan and annual workplan are under development. The Great Basin CESU website, <http://cnr.usu.edu/gbcesu/> is under construction, and will be maintained by Utah State University.

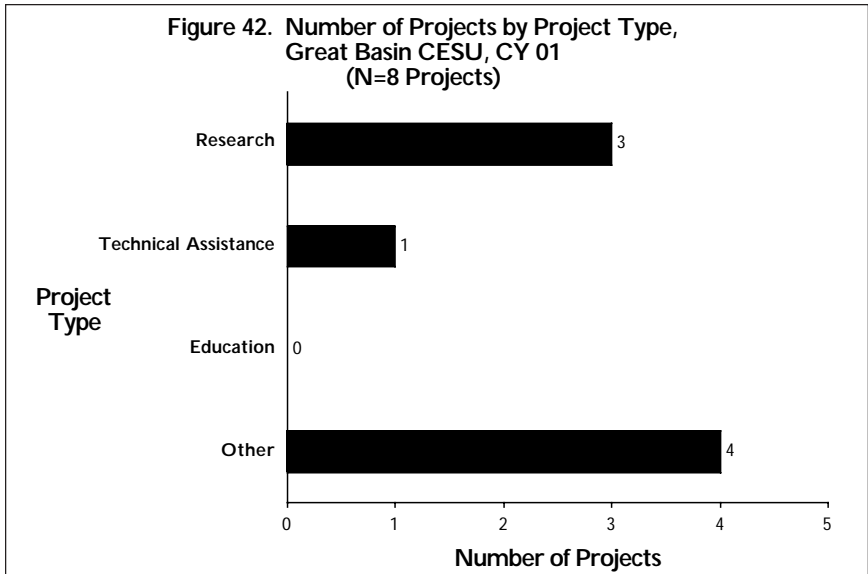
At the close of CY 2001, the Great Basin CESU was responsible for 8 projects totaling \$331,500 in support funds (see Figures 42-45). 38% of the projects were research-oriented, 12% provided technical assistance, and 50% of the projects were general or "other." By scientific discipline, 13% involved the biological sciences, 25% involved the cultural sciences, and 62% of the projects were general or interdisciplinary. Small projects of less than \$25,000 in support funds were most common (63%), while 37% of the projects in CY 2001 were between \$25,001 and \$250,000 in cost. The National Park Service provided 82% of the total project funds, the US Geological Survey provided 12%; other federal agencies collectively provided 6% of project costs.

Selected projects within the Great Basin CESU focused on:

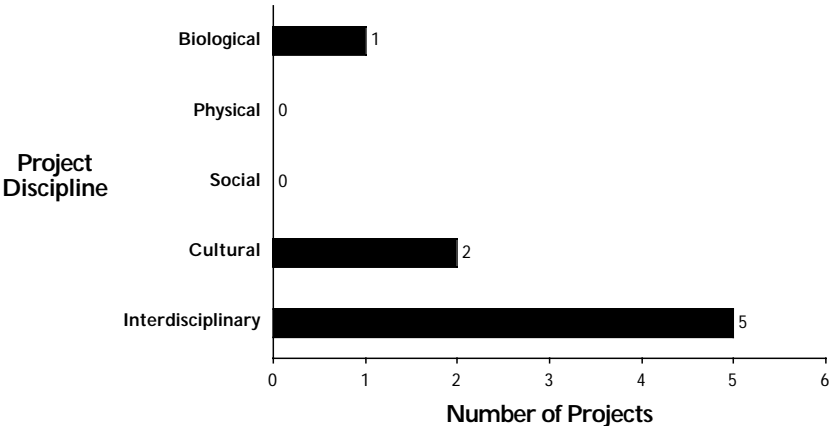
- conducting a traditional use study in Lassen Volcanic National Park (NPS), and

- surveying threatened Desert Bighorn populations (NPS, USGS).

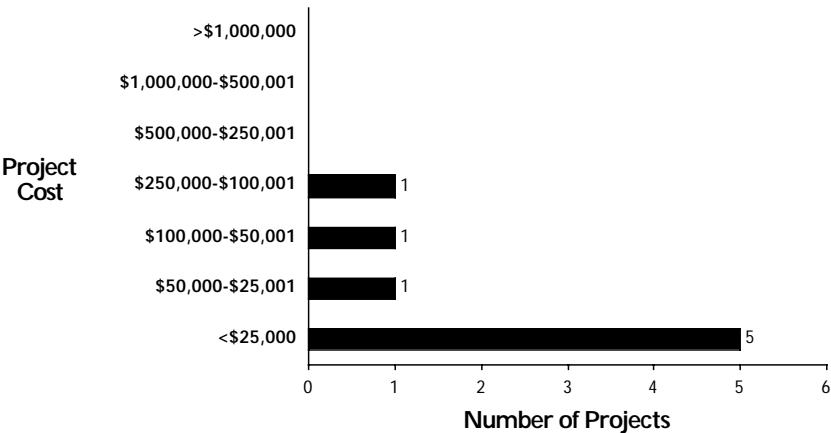
More information about the Great Basin CESU is available at <http://cnr.usu.edu/gbcesu/> and/or by contacting Dr. David Thawley (dthawley@cabnr.unr.edu), Dr. Rang Narayanan (rang@cabnr.unr.edu), or Dr. Hudson Glimp (hglimp@cabnr.unr.edu) at the University of Nevada - Reno.



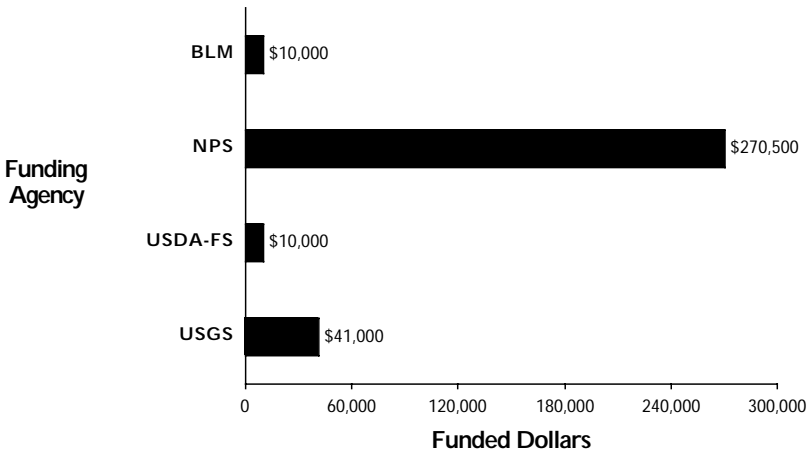
**Figure 43. Number of Projects by Project Discipline,
Great Basin CESU, CY 01
(N=8 Projects)**



**Figure 44. Number of Projects by Project Cost,
Great Basin CESU, CY 01
(N=8 Projects; \$0.33 million)**



**Figure 45. Funded Dollars by Funding Agency,
Great Basin CESU, CY 01
(N=8 Projects; \$0.33 million)**



Conclusion

Management of the nation's lands and waters requires skillful public service supported by sound science. The challenges of the 21st century, and the environmental choices to be decided by and on behalf of the American people, will demand even more skill and science. Universities play a critical role in providing information for science-based decision-making. CESUs are an important innovation in how federal agencies can work together with the nation's universities. CESUs are an efficient and cost-effective mechanism for delivery of scientific information to federal resource managers. CESUs, and the network of science partnerships that they are creating, are critically important. Both will serve the federal government, its partners, and the public in responding to the new century's demands.

Appendix I. Host and Partner Institutions in the CESU Network.

Universities

Appalachian State University
Arizona State University
Auburn University
Barry University
Colorado State University
D-Q University
Diné College
Florida A&M University
Florida Atlantic University
Fond du Lac Tribal and Community College
Frostburg State University
George Mason University
Great Basin College
Haskell Indian Nations University
Heritage College
Howard University
Idaho State University
Indiana University
Langston University
Little Priest Tribal College
Louisiana State University
Michigan State University
Michigan Technological University
Minnesota State University - Mankato
Mississippi State University
Montana State University
New Mexico State University
Northern Arizona University
Nova Southeastern University
Oregon State University
Pennsylvania State University
Rutgers University
Salish Kootenai College
South Dakota State University

Southern University and A&M College
Southwest Texas State University
SUNY-College of Environmental Science and Forestry
Texas A&M University
Texas A&M University - Corpus Christi
Texas A&M University - Galveston
Texas A&M University - Kingsville
Troy State University
Tuskegee University
University of Alaska - Anchorage
University of Alaska - Southeast
University of Arizona
University of British Columbia
University of California - Riverside
University of Central Florida
University of Colorado-Boulder and Denver
University of Florida
University of Georgia
University of Idaho
University of Iowa
University of Louisiana - Lafayette
University of Maryland - Baltimore County
University of Maryland Center for Environmental Science
University of Maryland - College Park
University of Maryland - Eastern Shore
University of Massachusetts - Amherst
University of Miami
University of Minnesota
University of Montana
University of Nebraska - Lincoln
University of Nevada - Reno
University of Nevada - Las Vegas
University of North Carolina - Wilmington
University of North Dakota
University of Oklahoma
University of Oregon
University of Puerto Rico
University of Rhode Island

University of South Dakota
University of Tennessee
University of Texas - Austin
University of the District of Columbia
University of the Virgin Islands
University of Toledo
University of Utah
University of Vermont
University of Virginia
University of Washington
University of Wisconsin - Madison
University of Wyoming
Utah State University
Washington State University
West Virginia University
Western Carolina University
Western Washington University

Other Partners

Alaska Department of Fish and Game
American Indian Science and Engineering Society
Arizona-Sonora Desert Museum
Audubon of Florida
Coastal Conservation Association
Desert Research Institute
Foothills Land Conservancy
Great Lakes Commission
Great Smoky Mountains Conservation Association
International Association for Great Lakes Research
Joint Institute for Energy and the Environment
Minnesota Department of Natural Resources
Minnesota Forest Resources Council
Museum of Northern Arizona
National Council for Air and Stream Improvement
Navajo Nation Archaeology Department
Oak Ridge National Laboratory
Sonoran Institute
Southern Appalachian Man and Biosphere

The Arboretum at Flagstaff
The Great Lakes Forest Alliance
The Nature Conservancy
The Science Museum of Minnesota
White Mountain Research Station

Appendix II. Two CESUs established in FY 2002.

Great Lakes-Northern Forest CESU (Host: University of Minnesota)

12 States represented by host and partners: Indiana, Iowa, Louisiana, Massachusetts, Michigan, Minnesota, New Mexico, New York, Ohio, Vermont, West Virginia, and Wisconsin

Federal Partners:

- Bureau of Land Management
- US Geological Survey
- National Park Service
- USDA Forest Service
- Natural Resources Conservation Service
- National Aeronautics and Space Administration

Partner Institutions (22):

- Fond du Lac Tribal and Community College
- Indiana University
- Michigan State University
- Michigan Technological University
- Minnesota State University - Mankato
- Southern University and A&M College
- SUNY-College of Environmental Science and Forestry
- University of Iowa
- University of Massachusetts - Amherst
- University of Toledo
- University of Vermont
- University of Wisconsin - Madison
- West Virginia University

- American Indian Science and Engineering Society
- Great Lakes Commission
- The Great Lakes Forest Alliance
- International Association for Great Lakes Research
- Minnesota Department of Natural Resources
- Minnesota Forest Resources Council
- National Council for Air and Stream Improvement
- The Nature Conservancy
- The Science Museum of Minnesota

Gulf Coast CESU (Host: Texas A&M University)

6 States represented by host and partners: Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas

Federal Partners:

- Bureau of Land Management
- US Geological Survey
- National Park Service
- Department of Defense
- Natural Resources Conservation Service
- National Aeronautics and Space Administration

Partner Institutions (15):

- Auburn University
- Louisiana State University
- Mississippi State University
- Southern University and A&M College
- Texas A&M University - Corpus Christi
- Texas A&M University - Galveston
- Texas A&M University - Kingsville
- Troy State University
- University of Central Florida
- University of Florida
- University of Georgia
- University of Louisiana - Lafayette
- University of Texas - Austin

- Coastal Conservation Association
- The Nature Conservancy

CESU National Staff

Dr. Gary E. Machlis
CESU National Coordinator
Department of the Interior
Main Interior Building
1849 C Street NW (3127)
Washington, DC 20240
gmachlis@uidaho.edu
Phone: (202) 208-5391
Fax: (202) 208-3060

Dr. Jean McKendry
CESU Deputy Coordinator
Department of the Interior
Main Interior Building
1849 C Street NW (3127)
Washington, DC 20240
jeanm@uidaho.edu
Phone: (202) 219-8894
Fax: (202) 208-3060

Sandy Watson
Management Assistant
College of Natural Resources, Room 16
University of Idaho
PO Box 441133
Moscow, Idaho 83844-1133
swatson@uidaho.edu
Phone: (208) 885-7054
Fax: (208) 885-4261

CESU Council Members

Jeff Amthor

Program Manager

Environmental Sciences Division, SC-74

Department of Energy

19901 Germantown Road

Germantown, MD 20874-1290

Jeff.Amthor@science.doe.gov

Phone: (301) 903-2507

Fax: (301) 903-8519

Sue Haseltine

Chief Scientist-Biology

US Geological Survey

Biological Resources Division

12201 Sunrise Valley Drive (300)

Reston, VA 20192

Susan_Haseltine@usgs.gov

Phone: (703) 648-4051

Fax: (703) 648-4039

Rich Guldin

Staff Director for Science Policy, Planning, Inventory, and Information

USDA Forest Service

RPC 4th Floor

PO Box 96090

Washington, DC 20090-6090

rguldin@fs.fed.us

Phone: (703) 605-4177

Fax: (703) 605-5131

Mike Soukup
Associate Director, Natural Resource Stewardship & Science
National Park Service
1849 C Street NW (3127)
Washington, DC 20240
mike_soukup@nps.gov
Phone: (202) 208-3884
Fax: (202) 273-4431

(to be announced)
Bureau of Land Management
1849 C Street NW
Washington, DC 20240

Shannon Cunniff
Director of Research and Natural Resources
US Bureau of Reclamation
1849 C Street NW (7060)
Washington, DC 20240
scunniff@usbr.gov
Phone: (202) 513-0682
Fax: (202) 513-0302

Robyn Thorson
Assistant Director-External Affairs
US Fish and Wildlife Service
1849 C Street NW (3012)
Washington, DC 20240
Robyn_Thorson@fws.gov
Phone: (202) 208-6541
Fax: (202) 501-6589

L. Peter Boice
Director of Conservation
Office of Deputy Under Secretary of Defense
Installations and Environment
1225 Old Jefferson Davis Highway, Suite 1500
Arlington, VA 22202-4336
Peter.Boice@osd.mil
Phone: (703) 604-0524
Fax: (703) 607-3124

Norman Rubinstein
Senior Science Advisor
Environmental Protection Agency
239 Woodward Hall
University of Rhode Island
Kingston, RI 02881
normr@etal.uri.edu
Phone: (401) 874-2491
Fax: (401) 874-4561

Ann Clarke
National Aeronautics and Space Administration
Code JE
300 E Street SW
Washington, DC 20546
aclarke@hq.nasa.gov
Phone: (202) 358-0007
Fax: (202) 358-2861

Sheryl Kunickis
Acting National Agricultural Research Coordinator
Natural Resources Conservation Service
5601 Sunnyside Avenue
Room 4-2274
Beltsville, MD 20705-5140
shk@ars.usda.gov
Phone: (301) 504-4787
Fax: (301) 504-6231

Evert Byington
National Program Leader, Rangeland, Pasture, and Forages
Natural Resources and Sustainable Agricultural Systems
Agricultural Research Service
5601 Sunnyside Avenue
Room 4-2278
Beltsville, MD 20705-5140
ekb@ars.usda.gov
Phone: (301) 504-4625
Fax: (301) 504-6231

Dr. Gary E. Machlis
National Coordinator, CESU Network
Department of the Interior
1849 C Street NW (3127)
Washington, DC 20240
gmachlis@uidaho.edu
Phone: (202) 208-5391
Fax: (202) 208-3060

CESU Council Alternates

Roger Dahlman
Program Manager
Environmental Sciences Division, SC-74
Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290
ROGER.DAHLMAN@science.doe.gov
Phone: (301) 903-9451
Fax: (301) 903-8519

Colleen Charles
US Geological Survey
Biological Resources Division
12201 Sunrise Valley Drive (301)
Reston, VA 20192
Colleen_Charles@usgs.gov
Phone: (703) 648-4110
Fax: (703) 648-4238

Bill Lange
Science Policy Analyst
USDA Forest Service
RPC 4th Floor
PO Box 96090
Washington, DC 20090-6090
wlange@fs.fed.us
Phone: (703) 605-4179
Fax: (703) 605-5131

John Dennis
National Park Service
1849 C Street NW (2300)
Washington, DC 20240
john_dennis@nps.gov
Phone: (202) 513-7174
Fax: (202) 371-2131

John Haugh
Senior Ecologist
Bureau of Land Management
WO-210 LS-1050
1849 C Street NW
Washington, DC 20240
john_haugh@blm.gov
Phone: (202) 452-5071
Fax: (202) 452-5112

Chuck Hennig
S&T Program Coordinator
US Bureau of Reclamation (D-9000)
PO Box 25007
Denver Federal Center
Denver, CO 80225-0007
chennig@do.usbr.gov
Phone: (303) 445-2134
Fax: (303) 445-6326

Robert Blohm
US Fish and Wildlife Service
1849 C Street NW (3012)
Washington, DC 20240
Robert_Blohm@fws.gov
Phone: (703) 358-1966

Stephanie Lamb
Office of Deputy Under Secretary of Defense
Installations and Environment
1225 Jefferson Davis Highway, Suite 1500
Arlington, VA 22202
Stephanie.Lamb@osd.mil
Phone: (703) 604-1933
Fax: (703) 607-3124

Michael E. McDonald
Director, EMAP Program
Environmental Protection Agency
MD-87
USEPA Mailroom
Research Triangle Park, NC 27711
mcdonald.michael@epa.gov
Phone: (919) 541-7973
Fax: (919) 541-4621

(to be announced)
National Aeronautics and Space Administration

Ingrid Milton
Office of the Deputy Chief for Science and Technology
Natural Resources Conservation Service
PO Box 2890
Washington, DC 20013-2890
ingrid.milton@usda.gov
Phone: (202) 690-2010
Fax: (202) 720-4839

More information about the Cooperative Ecosystem Studies Units Network is available at: <http://www.cesu.org/cesu> and/or by contacting Dr. Gary E. Machlis, CESU National Coordinator, at the University of Idaho (gmachlis@uidaho.edu).



Notes

Notes

Cooperative Ecosystem Studies Units Network

regions in the
CESU Network

regions to be
established in FY 03

Pacific
Northwest

Californian

- ★ Host University
- Partner University or Institution

CHWA Chesapeake Watershed CESU
COPL Colorado Plateau CESU
DESO Desert Southwest CESU
GRBA Great Basin CESU
GRLA Great Lakes – Northern Forest CESU
GRPL Great Plains CESU
GUOCO Gulf Coast CESU
NOAT North Atlantic Coast CESU
PANO Pacific Northwest CESU
ROMO Rocky Mountains CESU
SOAP Southern Appalachian Mountains CESU
SOFL South Florida – Caribbean CESU

Hawaii –
Pacific Islands

The Hawaii – Pacific Islands region also encompasses
U.S. Territories and Commonwealths.

Rocky
Mountains

Great
Basin

Colorado
Plateau

Great
Plains

Desert
Southwest

Gulf Coast

Great Lakes –
Northern Forest

Southern
Appalachian
Mountains

North
Atlantic
Coast

Chesapeake
Watershed

- ★ USM
- FSU
- GMU
- PSU
- UMBC
- UMCE
- UMCP
- UDC
- UVA

Piedmont – South
Atlantic Coast

South Florida –
Caribbean

Boundaries are approximate.
University abbreviations are
explained on the reverse side.
Prepared by CESU Council Staff,
September 2002.

The CESU Network, September 2002

Chesapeake Watershed CESU	CHWA	
The University System of Maryland (Host)	USM	Frostburg, MD
Frostburg State University	FSU	Frostburg, MD
George Mason University	GMU	Fairfax, VA
Pennsylvania State University	PSU	State College, PA
University of Maryland, Baltimore County	UMBC	Baltimore, MD
University of Maryland Center for Environmental Science	UMCE	Frostburg, MD
University of Maryland, College Park	UMCP	College Park, MD
University of the District of Columbia	UDC	Washington, DC
University of Virginia	UVA	Charlottesville, VA

Bureau of Land Management
US Geological Survey
National Park Service
Department of Defense

Colorado Plateau CESU	COPL	
Northern Arizona University (Host)	NAU	Flagstaff, AZ
Arizona State University	ASU	Tempe, AZ
Colorado State University	CSU	Fort Collins, CO
Diné College	DIC	Tsalie, AZ
Haskell Indian Nations University	HINU	Lawrence, KS
Oregon State University	OSU	Corvallis, OR
University of Arizona	UA	Tucson, AZ
University of Nevada, Reno	UNR	Reno, NV
Utah State University	USU	Logan, UT
The Arboretum at Flagstaff	AF	Flagstaff, AZ
Museum of Northern Arizona	MNA	Flagstaff, AZ
Navajo Nation Archaeology Department	NNAD	Window Rock, AZ

Bureau of Land Management
Bureau of Reclamation
US Geological Survey
National Park Service
USDA Forest Service

Desert Southwest CESU	DESO	
University of Arizona (Host)	UA	Tucson, AZ
Howard University	HU	Washington, DC
New Mexico State University	NMSU	Las Cruces, NM
Southwest Texas State University	STSU	San Marcos, TX
University of California, Riverside	UCR	Riverside, CA
Arizona-Sonora Desert Museum	ASDM	Tucson, AZ
Sonoran Institute	SI	Tucson, AZ

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service
Department of Defense

Great Basin CESU	GRBA	
University of Nevada (Host)	UNR	Reno, NV
D-Q University	DQU	Davis, CA
Desert Research Institute	DRI	Reno, NV
Great Basin College	GBC	Elko, NV
Haskell Indian Nations University	HINU	Lawrence, KS
Idaho State University	ISU	Pocatello, ID
Oregon State University	OSU	Corvallis, OR
University of Nevada, Las Vegas	UNLV	Las Vegas, NV
University of Utah	UOU	Salt Lake City, UT
Utah State University	USU	Logan, UT
White Mountain Research Station	WMRS	Bishop, CA

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service

Great Lakes - Northern Forest CESU	GRLA	
University of Minnesota (Host)	UMN	Minneapolis, MN
Fond du Lac Tribal and Community College	FTCC	Cloquet, MN
Indiana University	IU	Bloomington, IN
Michigan State University	MSU	East Lansing, MI
Michigan Technological University	MTU	Houghton, MI
Minnesota State University, Mankato	MSUS	Mankato, MN
Southern University and A&M College	SUBR	Baton Rouge, LA
SUNY-College of Environmental Science and Forestry	ESF	Syracuse, NY
University of Iowa	UIA	Iowa City, IA
University of Massachusetts, Amherst	UMASS	Amherst, MA
University of Toledo	UT	Toledo, OH
University of Vermont	UVM	Burlington, VT
University of Wisconsin, Madison	UWM	Madison, WI
West Virginia University	WVU	Morgantown, WV
American Indian Science and Engineering Society	AISES	Albuquerque, NM
Great Lakes Commission	GLC	Ann Arbor, MI
The Great Lakes Forest Alliance	GLFA	Hayward, WI
International Association for Great Lakes Research	IAGLR	Ann Arbor, MI
Minnesota Department of Natural Resources	MDNR	St. Paul, MN
Minnesota Forest Resources Council	MFRC	St. Paul, MN
National Council for Air and Stream Improvement	NCASI	Kalamazoo, MI
The Nature Conservancy	TNCM	Minneapolis, MN
The Science Museum of Minnesota	SMM	St. Paul, MN

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service
Natural Resources Conservation Service
National Aeronautics & Space Administration

Great Plains CESU	GRPL	
University of Nebraska (Host)	UNL	Lincoln, NE
Colorado State University	CSU	Fort Collins, CO
Langston University	LU	Langston, OK
Little Priest Tribal College	LPTC	Winnebago, NE
South Dakota State University	SDSU	Brookings, SD
Texas A&M University	TAMU	College Station, TX
University of Minnesota	UMN	Minneapolis, MN
University of North Dakota	UND	Grand Forks, ND
University of Oklahoma	UOK	Norman, OK
University of South Dakota	USD	Vermillion, SD
University of Wyoming	UWY	Laramie, WY

Bureau of Land Management
Bureau of Reclamation
US Geological Survey
National Park Service
USDA Forest Service

Gulf Coast CESU	GUCO	
Texas A&M University (Host)	TAMU	College Station, TX
Auburn University	AU	Auburn, AL
Louisiana State University	LSU	Baton Rouge, LA
Mississippi State University	MSU	Mississippi State, MS
Southern University and A&M College	SUBR	Baton Rouge, LA
Texas A&M University, Corpus Christi	TAMUCC	Corpus Christi, TX
Texas A&M University, Galveston	TAMUG	Galveston, TX
Texas A&M University, Kingsville	TAMUK	Kingsville, TX
Troy State University	TSU	Troy, AL
University of Central Florida	UCF	Orlando, FL
University of Florida	UFL	Gainesville, FL
University of Georgia	UG	Athens, GA
University of Louisiana, Lafayette	UL	Lafayette, LA
University of Texas, Austin	UTA	Austin, TX
Coastal Conservation Association	CCA	Houston, TX
The Nature Conservancy	TNCT	San Antonio, TX

Bureau of Land Management
US Geological Survey
National Park Service
Department of Defense
Natural Resources Conservation Service
National Aeronautics & Space Administration

North Atlantic Coast CESU	NOAT	
University of Rhode Island (Host)	URI	Kingston, RI
Rutgers University	RU	New Brunswick, NJ
University of Maryland, Eastern Shore	UMES	Princess Anne, MD
University of Massachusetts, Amherst	UMASS	Amherst, MA

US Geological Survey
National Park Service

Pacific Northwest CESU	PANO	
University of Washington (Host)	UW	Seattle, WA
Heritage College	HC	Toppenish, WA
Oregon State University	OSU	Corvallis, OR
Tuskegee University	TU	Tuskegee, AL
University of Alaska, Anchorage	UAA	Anchorage, AK
University of Alaska, Southeast	UAS	Juneau, AK
University of British Columbia	UBC	Vancouver, BC
University of Idaho	UI	Moscow, ID
University of Oregon	UOR	Eugene, OR
University of Vermont	UVM	Burlington, VT
Washington State University	WSU	Pullman, WA
Western Washington University	WWU	Bellingham, WA
Alaska Department of Fish and Game	ADFG	Juneau, AK

Bureau of Land Management
US Fish and Wildlife Service
US Geological Survey
National Park Service
USDA Forest Service

Rocky Mountains CESU	ROMO	
University of Montana (Host)	UMT	Missoula, MT
Montana State University	MSU-B	Bozeman, MT
Salish Kootenai College	SKC	Pablo, MT
University of Colorado	CU	Boulder & Denver, CO
University of Idaho	UI	Moscow, ID
University of Wyoming	UWY	Laramie, WY
Utah State University	USU	Logan, UT
Washington State University	WSU	Pullman, WA

Bureau of Land Management
US Geological Survey
National Park Service
USDA Forest Service

South Florida - Caribbean CESU	SOFL	
University of Miami (Host)	UM	Coral Gables, FL
Barry University	BU	Miami Shores, FL
Florida A&M University	FAMU	Tallahassee, FL
Florida Atlantic University	FAU	Boca Raton, FL
Nova Southeastern University	NSU	Fort Lauderdale, FL
University of Florida	UFL	Gainesville, FL
University of North Carolina, Wilmington	UNC-W	Wilmington, NC
University of Puerto Rico	UPC	San Juan, PR
University of the Virgin Islands	UVI	St. Thomas, USVI
Audubon of Florida	AF	Miami, FL

Bureau of Land Management
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National Park Service

Southern Appalachian Mountains CESU	SOAP	
University of Tennessee (Host)	UTK	Knoxville, TN
Appalachian State University	APSU	Boone, NC
Florida A&M University	FAMU	Tallahassee, FL
Western Carolina University	WCU	Cullowhee, NC
Foothills Land Conservancy	FLC	Maryville, TN
Great Smoky Mountains Conservation Association	GSCA	Knoxville, TN
Joint Institute for Energy and the Environment	JIEE	Knoxville, TN
National Council for Air and Stream Improvement	NCASI	Clemson, SC
Oak Ridge National Laboratory	ORNL	Oak Ridge, TN
Southern Appalachian Man and Biosphere	SAMMB	Knoxville, TN

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